



**AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES
END OF SEMESTER EXAMINATIONS DECEMBER 2025**

COURSE CODE & TITLE: DOP 115 Epidemiology and Research Method

DATE: 3 December 2025

Duration: 2 HOURS

Start:

Finish:

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. Data collection about everyone in group or population and has the advantage of accuracy and detail is: -
 - A. Census
 - B. Survey
 - C. Probability sampling
 - D. Cluster
2. The degree with which an instrument measures the attribute it is supposed to be measuring is called: -
 - A. Specificity
 - B. Reliability
 - C. Validity
 - D. Objectivity
3. Descriptive epidemiology focuses on the description of the following elements: -
 - A. Place, Person, Pattern
 - B. Place, Person, Time
 - C. People, Place, Pattern
 - D. People, Time, Frequency
4. The following are the main features of Experimental research: -
 - A. Control, Sampling, Manipulation
 - B. Control, Randomization, Manipulation
 - C. Sampling, Randomization, Correlation
 - D. Control, Manipulation, Placebo
5. Which of the following data presentation method is the best suited graphical presentation of categorical data: -
 - A. Line graph
 - B. Scatter plot
 - C. Histogram
 - D. Bar diagram
6. In a cohort of breast cancer survivors, 15 out of 250 women who received radiation therapy developed lymphedema, while 5 out of 100 who did not receive radiation developed lymphedema. The Relative Risk (RR) of developing lymphedema associated with radiation therapy is: -
 - A. 1.5
 - B. 2.0
 - C. 3.0
 - D. 1.2
7. A study reports an odds ratio (OR) of 1.0 for the relationship between chemotherapy and nausea. The statement that BEST describes this finding is: -
 - A. Chemotherapy significantly increases the odds of nausea.
 - B. Chemotherapy significantly decreases the odds of nausea.
 - C. Chemotherapy has no effect on the odds of nausea.
 - D. Chemotherapy doubles the odds of nausea.
8. A key characteristic of normal distribution is: -
 - A. Mean, median, and mode are almost similar.
 - B. The distribution is skewed to the right.
 - C. Most values fall at the extreme ends.
 - D. The mean is always greater than the median.

9. In a normal distribution, approximately 95% of data values fall within: -
- A. ± 1 standard deviation of the mean
 - B. ± 2 standard deviations of the mean
 - C. ± 3 standard deviations of the mean
 - D. ± 4 standard deviations of the mean
10. Type II error occurs when a researcher:
- A. Rejects a true null hypothesis.
 - B. Fails to reject a false null hypothesis.
 - C. Accepts a false alternative hypothesis.
 - D. Uses a significance level that is too low
11. In a study of fatigue among cancer survivors, the researcher records the number of hours of sleep per night. The level of measurement for this variable is: -
- A. Ratio
 - B. Nominal
 - C. Ordinal
 - D. Interval
12. A statement that BEST describes two groups with similar mean values but with standard deviation (SD) of 22 and 6 for groups A and B respectively is: -
- A. The group with SD = 22 has data more consistently near the mean.
 - B. The group with SD = 6 has data more spread out from the mean.
 - C. The group with SD = 6 has data more consistently near the mean.
 - D. Group A and B both have data significantly spread out from the mean
13. A boolean operator that can be used to maximize the number of search results is: -
- A. AND
 - B. OR
 - C. NOT
 - D. NEAR
14. A researcher wants to study whether chemotherapy reduces fatigue in breast cancer patients compared to standard care. The element of PICO that explains “fatigue reduction” is: -
- A. P – Population
 - B. I – Intervention
 - C. C – Comparison
 - D. O – Outcome
15. The MOST appropriate analysis to test whether chemotherapy side effects (nausea, fatigue, hair loss) are associated with age group (<50 years, ≥ 50 years) is: -
- A. T-test
 - B. ANOVA
 - C. Chi-square test
 - D. Pearson correlation

16. A correlation coefficient (r) of 0.85 between fatigue level and depression score in cancer patients would be interpreted as: -
- There is a strong positive correlation; as fatigue increases, depression tends to increase.
 - There is a weak negative correlation; as fatigue increases, depression tends to decrease.
 - There is a strong positive correlation; as fatigue decreases, depression tends to increase.
 - There is a weak negative correlation; as fatigue decreases, depression tends to increase.
17. A strategy that helps in reducing selection bias in clinical research is: -
- Randomization of participants to treatment groups
 - Allowing the researcher to select participants based on convenience
 - Blinding the outcome assessors
 - Reporting only statistically significant results
18. The following is CORRECT regarding non-probability sampling technique: -
- Every member of the population has a known and equal chance of being selected
 - It is often used when it is difficult to access the entire population
 - It always produces a representative sample
 - Randomization is essential in this technique
19. It is important for oncology nursing researchers to define clear objectives before conducting a study so as: -
- To ensure the study is published in high-impact journals
 - To guide study design, data collection, and analysis
 - To avoid the need for ethical approval
 - To replace the need for a literature review
20. A conceptual framework is: -
- A set of statistical tests used to conduct qualitative and quantitative data analysis of the study
 - A detailed description of the study population, study location, study design as well as the ethics
 - A visual or written representation showing the relationship between key concepts in a study
 - A checklist for ethical approval by the institutional ethics review committee

SECTION II: SHORT ANSWER QUESTIONS (30 MARKS)

- Briefly describe the retrospective case control research study design 5 Marks
- A researcher wants to compare the mean weight loss in cancer patients receiving chemotherapy versus those receiving radiotherapy over a 3-month period. Group 1 (Chemotherapy): 20 patients, mean weight loss = 4.2 kg, standard deviation = 1.8 kg. Group 2 (Radiotherapy): 18 patients, mean weight loss = 3.1 kg, standard deviation = 1.5 kg. Assuming equal variances, an independent samples t-test was conducted. The calculated t-statistic = 2.01 with degrees of freedom (df) = 36, and the p-value = 0.052.
 - State the null and alternative hypotheses for this test. 2 Marks
 - Using the t-test results provided, what is your conclusion at the 5% significance level? 2 Marks
 - Outline the difference between t-test and Analysis of Variance (ANOVA) 2 Marks

3. The following data was collected among patients who had been diagnosed with prostate cancer. The figures show the survival time (in years) from the time of diagnosis to the time of death for 9 individuals.
5, 6, 9, 5, 10, 11, 7, 14, 5
- a) Calculate the mean 2 Marks
 - b) Identify the median 1 Mark
 - c) Identify the mode 1 Mark
 - d) Calculate the IQR 2 Marks
 - e) Calculate the Standard Deviation 3 Marks
4. State the FIVE (5) phases of the research process 5 Marks
5. Outline five (5) elements of an informed consent 5 Marks

SECTION III: LONG ANSWER QUESTION – (20 MARKS)

1. You have been appointed to participate in the formulation of a study intended to explore the perception of computer scientist in Nairobi, Kenya on retinoblastoma and its association with prolonged computer use. The team agrees to use mixed methods approach.
- a) Highlight FOUR (4) differences between qualitative and quantitative methods 4 Marks
 - b) Explain FOUR (4) data collection methods for qualitative research method 8 Marks
 - c) Explain FOUR (4) ethical principles you would apply in this study 8 Marks