Uganda Martyrs University

Faculty of Health Sciences

Bachelor of Public Health - Health Promotion

End of Semester 1 Examination Year 2 (2018)

COURSE UNIT: BASIC EPIDEMIOLOGY& BIOSTATISTICS CODE: BPHP2218

Date: 1st February, 2020 **Time: 9:00am-12:00pm**

INSTRUCTIONS

Answer all questions in section A and B

All answers must be written in the answer sheets provided

Do not write anything in this question paper including rough work.

Section A. (40 marks)

1. Epidemiologists are interested in learning aboutt
    A. The causes of diseases and how to cure or control them
    B. The frequency and geographic distribution of diseases
    C. The causal relationships between diseases
    D. all of the above
2. The sum of all squared deviations is divided by total number of observations to calculate
    A. population deviation
    B. population variance
    C. sample deviation
    D. sample variance
3. If value of first quartile is 49 and value of third quartile is 60 then value of inter quartile range is
    A. 21
    B. 31
    C. 11
    D. 41
4. If the total sum of square is 20 and sample variance is 5 then total number of observations are
    A. 15
    B. 25
    C. 4

D. 35

5. Variability which is defined as difference between third and first quartile is considered as
   A. Quartile range
   B. Deciles range
   C. Percentile range
   D. Inter quartile range
6. In the Mulago Women's Hospital Health Study,researchers enrolled 41,837 women in 1986 and collected exposure and lifestyle information to assess the relationship between these factors and subsequent occurrence of cancer, this is an example of.....
   A. Experimental study
   B. Cross sectional study
   C. Cohort study
   D. Case-control study
7. A study in which children are randomly assigned to receive either a newly formulated vaccine or the currently available vaccine, and are followed to monitor for side effects and effectiveness of each vaccine, is an example of which type of study?
   A. Observational
   B. Cohort
   C. Case-control
   D. Clinical trial
8. A propagated epidemic is usually the result of what type of exposure?
   A. Point source
   B. Continuous common source
   C. Intermittent common source
   D. Person-to-person
9. The epidemiologic triad of disease causation refers to:
   A. Agent, host, environment
   B. Time, place, person
   C. Source, mode of transmission, susceptible host
   D. All the above
10. Diseases that are always present in a community, usually at a low, more or less constant, frequency are classified as having an _____ pattern.
   A. Epidemic
   B. Endemic
   C. Pandemic
   D. Virulent
11. A numerical value used as a summary measure for a sample, such as sample mean, is known as a
   A. Population parameter
   B. Sample parameter
   C. Sample statistic
   D. Population mean

12. Which one is the not measure of dispersion.
    A. The Range
    B. Median
    C. Inter-Quartile Range
    D. Variance
13. Data in the Population Census Report is an example of:
    A. Grouped data
    B. Ungrouped data
    C. Secondary data
    D. Primary data
14. Which of the following is not a measure of central tendency?
    A. Percentile
    B. Quartile
    C. Standard deviation
    D. Mode
15. A parameter is a measure which is computed from
    A. Population data
    B. Sample data
    C. Test statistics
    D. None of these
16. If the standard deviation of a population is 9, the population variance is:
    A. 9
    B. 3
    C. 21
    D. 81
17. Find the median of the following data: 160, 400, 200, 280, 180, 300, 320
    A. 140
    B. 300
    C. 180
    D. 280
18. In a week the prices of a bag of rice were 350, 280, 340, 290, 320, 310, 300. The range is
    A. 60
    B. 90
    C. 70
    D. 100
19. Rejection of the null hypothesis is a conclusive proof that the alternative hypothesis is
    A. True
    B. False
20. The level of significance can be viewed as the amount of risk that an analyst will accept when making a decision
    A. True
    B. False
21. By taking a level of significance of 5% it is the same as saying

A. We are 5% confident the results have not occurred by chance
B. We are 95% confident that the results have not occurred by chance
C. We are 95% confident that the results have occurred by chance
D. We are 5% correct

22. Two types of errors associated with hypothesis testing are Type I and Type II. Type II error is committed when
A. We reject the null hypothesis while the alternative hypothesis is true
B. We reject a null hypothesis when it is true
C. We accept a null hypothesis when it is not true
D. We accept both the null and alternative hypothesis

23. In which of the following types of sampling the information is carried out under the opinion of an expert?
A. Quota sampling
B. Convenience sampling
C. Random sampling
D. Judgement sampling

24. Any population which we want to study is referred as?
A. Standard population
B. Final population
C. Infinite population
D. Target population

25. A statement made about a population for testing purpose is called?
A. Statistic
B. Hypothesis
C. Level of Significance
D. Test-Statistic

26. The assumed hypothesis tested for rejection considering it to be true is called?
A. Null Hypothesis
B. Statistical Hypothesis
C. Simple Hypothesis
D. Composite Hypothesis

27. The point where the Null Hypothesis gets rejected is known as?
A. Significant Value
B. Rejection Value
C. Acceptance Value
D. Critical Value

28. If the Critical region is evenly distributed then the test is referred as?
A. Two tailed
B. One tailed
C. Three tailed
D. Zero tailed

29. The probability of Type I error is referred as?
A. $1-\alpha$
B. β
C. α

D. 1-β

30. Type I error occurs when?
    A. We reject H_0 if it is True
    B. We reject H_0 if it is False
    C. We accept H_0 if it is True
    D. We accept H_0 if it is False
31. The rejection probability of Null Hypothesis when it is true is called as?
    A. Level of Confidence
    B. Level of Significance
    C. Level of Margin
    D. Level of Rejection
32. The cluster sampling, stratified sampling or systematic samplings are types of _____
    A. Direct sampling
    B. Indirect sampling
    C. Random sampling
    D. Non random sampling
33. In a two tailed test when a Null Hypothesis is rejected for a True Alternative Hypothesis then it has _____
    A. Type I error
    B. Type 2 error
    C. No error
    D. Many errors
34. In a hypothesis test, what does the p value signify?
    A. Smallest level of significance for rejection of Null Hypothesis
    B. Largest level of significance for rejection of Null Hypothesis
    C. Smallest level of significance for acceptance of Null Hypothesis
    D. Smallest level of significance for acceptance of Null Hypothesis
35. A community assesses a random sample of its residents by telephone questionnaire. Obesity is strongly associated with diagnosed diabetes. This study design is best described as which one of the following:
    A. Case-control
    B. Cohort
    C. Cross-sectional
    D. Experimental
36. The initial studies establishing maternal diethylstilbesterol (DES) intake as a cause of vaginal adenocarcinoma in female offspring were case-control studies. This was probably largely because:
    A. A couple of decades ago cohort studies hadn't been invented.
    B. A woman taking DES was always rare.
    C. The disease outcome is rare.
    D. The investigators had probably just happened to have a number of cases in their practices.
37. In an epidemiological context, what is the population at risk?
    A. The proportion of a population that engage in risky behaviours.

B. The group of people that may experience the outcome we want to study.
C. A group of people participating in a study that may be harmful to them.
D. The population group with the highest relative risk of disease.

38. Randomised, controlled trials provide strong evidence that an observed effect is due to the intervention (the assigned exposure). One reason is because
A. when the participants are randomised, many characteristics and possible confounding factors are likely to be evenly distributed in the groups.
B. it is easier to measure the outcome variable with great precision in randomised, controlled trials compared to in other study designs.
C. the exposure level and the outcome are measured at the same time.
D. the study participants are volunteers and therefore motivated to take part in the study.

39. Which of the following statements about exposures is true?
A. 'Exposure' refers to contact with some factor that may be harmful or beneficial to health.
B. An exposed individual has a greater risk of disease.
C. Dietary intake is not an 'exposure' because individuals make a choice about what they eat.
D. High body mass index is a risk factor for a range of health conditions; therefore, it cannot be treated as a single exposure.

40. Which of the following is an advantage of a case-control study?
A. There is little or no bias in assessment of exposure.
B. Multiple disease outcomes following a selected exposure can be readily studied.
C. It is possible to determine the true incidence of the disease.
D. It may be used to study etiology of a rare disease.

Section B: Answer all questions in this section

1. The information below was obtained from a survey conducted to determine the factors affecting recall ability among students in Uganda MATRYS university. It was noticed that age was a statistically significant factor (α=0.05). Forty students aged between 40-50 years in BPH class were given an assignment and their marks are shown below. Use this data to answer questions that follow.

73, 45, 62, 34, 59, 20, 48, 50, 78, 38,
52, 91, 57, 82, 46, 51, 62, 58, 39, 50,
72, 73, 63, 52, 41, 37, 28, 46, 71, 75,
36, 28, 44, 90, 51, 28, 60, 18, 47, 40.

i) Prepare a frequency distribution table for the student marks(4 marks)
ii) determine
a. Mean (4 marks)
b. Mode (4marks)
c. Median (4 marks)
d. Standard deviation (4 marks)

2. A third year MPH student in carrying out a study to determine the prevalence of HIV among newlywed couples after a mass wedding at a given church Kampala.

i) Describe onemost appropriate study design for this kind of study (5 marks)

ii) Explain the three merits and two limitations of the study design identified in section i) above (5 marks)

iii) This study had a sample size of 100 respondents and the results showed that the prevalence of HIV in among the wed couples was7.2% with a standard deviation of 10. Test the hypothesis that the prevalence of HIV the newly wed couples is different from the national prevalence of 6.4% (10 marks).

3. i) An epidemiologist is worried about the ever increasing trend of malaria among pregnant mothers and wants to estimate the current proportion of women infected in the peak malaria transmission period. If he intends to conduct a study in the Rubaga Hospital ANC unit. Previous studies conducted at the out patients department in Rubaga Hospital had recorded a 19% prevalence.

   i) Help the epidemiologist determine an appropriate sample size if he intends to maintain a 95% confidence level. (10 Marks)

   ii) Describe the possible non-probability sampling methods that can be used to select respondents for this study (10 marks)