



CHRISTIAN SERVICE UNIVERSITY COLLEGE, KUMASI, GHANA

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF PHYSICIAN ASSISTANTSHIP STUDIES

BSC. PHYSICIAN ASSISTANTSHIP STUDIES (MEDICAL)

END OF FIRST SEMESTER 2018/2019 ACADEMIC YEAR EXAMINATIONS

LEVEL 200

PACS 207: BIOSTATISTICS

May, 2019

Time Allowed: 2 Hours

SECTION A

GENERAL INSTRUCTIONS TO STUDENTS:

- Answer all questions in both sections A and B
- Section A: Answer this section on the question paper by **circling** the correct answer.
- Section B should be answered in the answer booklet that will be provided

1. The most frequently occurring score or value in a data set is known as
 - a. The range
 - b. Frequency distribution
 - c. The mode
 - d. Class-mid point

2. When a distribution presents only one mode, it is designated as
 - a. Tri-modal
 - b. Modesty
 - c. Uni-modal
 - d. Uni-median

3. A ratio is a fraction in which the numerator is not included in the denominator.
 - a. True
 - b. False

4. Number of persons who come to the Komfo Anokye Teaching Hospital each day is a continuous variable
 - a. True
 - b. False

5. Gender of patients attending Suntreso Government Hospital can be classified under discrete variables
 - a. True
 - b. False

6. Secondary data is originally collected by the researcher
 - a. True
 - b. False

7. A proportion is a ratio in which the numerator is a subset of the denominator.
 - a. True
 - b. False

8. Relying on results by gathered by Ghana demographic and health survey team is an example of a primary data
 - a. True
 - b. False

9. Data that is obtained from the internet can be said to be secondary
 - a. True
 - b. False

Read the preamble carefully and use it to answer questions 10-13.

Stata is a statistical tool used to analyse health data. Commands/files extensions such as (**.dta, log file, do-file, replace, recode**), needed to run descriptive analysis. Fill in the spaces with the appropriate command or code

10. command is used to convert variables such as age from raw state (ungrouped state) to categories (grouped)
11. Results or outputs of analysis performed in stata can be saved with the Command.
12. In data analysis, ensuring data consistency is key. A typical case is **peri-urban** wrongly captured as "**periurban**". As part of data cleaning purposes, the command is used to change the wrong entries to reflect the correct/accurate caption
13. code/ function is used to store commands for future use.
14. Which of the following STATA command will give us the mean and standard deviation of a numerical variable?
 - a. describe
 - b. codebook
 - c. sum
15. Which of the following command is correct in generating age category (agecat) from a variable (age)?
 - a. gen age=agecat
 - b. gen agecat=age
 - c. keep if gender=age
16. Select the correct command
 - a. replace agecat min/15=1
 - b. recode agecat min/15=1
 - c. change agecat min/15=1

17. It is helpful to use a multi-stage cluster sample for all the reasons below EXCEPT:

- a. The population is widely dispersed geographically
- b. When the population is small and community entry is challenging
- c. You want to use a probability sample in order to generalise the results

18. When each member of a population has an equally likely chance of being selected, this is called:

- a. An equal probability selection method
- b. A non-random sampling method
- c. A quota sample
- d. A snowball sample

19. The type of sampling in which each member of the population selected for the sample is returned to the population before the next member is selected is called?

- a. Stringent Representative Sampling
- b. Sampling with replacement
- c. Simple random sampling
- d. Probability Proportionate to Population Sampling

20. People who are available, volunteer, or can be easily recruited are used in the sampling method called?

- a. Simple random sampling
- b. Cluster sampling
- c. Systematic sampling
- d. Convenience sampling

21. There are two (2) branches of statistics; they are inferential and...

- a. Cumulative
- b. Descriptive
- c. Primary

22. The following are all methods used for obtaining data **except**

- a. Survey method
- b. Simple random method
- c. Observational method

23. A variable that can be measured in numbers or that is quantifiable is called...

- a. A constant variable
- b. Quantitative variable
- c. Population variable

- 24. One of the sources of obtaining data is through...
 - a. Probability source
 - b. Secondary source
 - c. Variable source

- 25. is a subset of the population.
 - a. Data
 - b. Sample
 - c. Parameter

- 26. A fraction expressed with a denominator of 100 is called.....
 - a. Median
 - b. Variance
 - c. Percentage

- 27. A continuous variable can be measured with the
 - a. Nominal scale
 - b. Probability scale
 - c. Interval scale

Part 2: Complete the sentences (question 28 to 31) with the appropriate term

The study of biostatistics has some key concepts (sample, variable, parameter, sampling, unit, sampling frame, and sampling interval). Read the scenario very carefully and use one of the concept to answer questions 8 to 11. Write in the space below.

In 2015 the Surgery department at the Suntreso Government hospital received about 1000 cases (Recorded in the register). In understanding their demographic characteristics, the HOD decided to investigate 120 of them.

- 28. The 120 the HOD decided to select referred to as.....
- 29. Each individual who constitutes the 1000 is referred to as.....
- 30. The process of selecting 120 out of 1000 is referred to as.....
- 31. A list of all the 1000 persons through which 120 will be obtained is.....

Part 3: Circle appropriately

32. The cost of services offered at the Nso Nyamey3 scan centre represent quantitative data
- True
 - False
33. The social security numbers of students in a class represent a qualitative data
- True
 - False
34. The gestational age of mothers seeking care at the Suntreso Government hospital is an example of a qualitative variable
- True
 - False
35. The **nationality** of each person in an airplane is a binary variable
- True
 - False
36. Inferential and descriptive statistics are examples of data collection methods
- True
 - False
37. The following are all methods used for obtaining data **except?**
- Survey method
 - Simple random method
 - Observational method
38. A variable that can be measured in numbers or that is quantifiable is called...
- A constant variable
 - Quantitative variable
 - Population variable
39. One of the non-probability sampling technique is.....
- Straight numerical sampling technique
 - Quota sampling technique
 - Cluster sampling technique

40. is a measurement done in the population.

- a. Statistic
- b. Sample
- c. Parameter

41. The median is the central number in a set of observation regardless the order in which they are arranged

- a. True
- b. False

42. One main example of the measurement of central tendency is the

- a. Ratio
- b. Mid point
- c. Mean

43. Variables such as gender (male-female) and age group (less than 20 years and above 20 years) can be measured with the:

- a. Nominal scale
- b. Probability scale
- c. Interval scale

44. The Central Limit Theorem states that given a sufficiently large sample size from a population with a finite level of variance, the mean of all samples from the same population will be approximately equal to the mean of the population.

- a. True
- b. False

45. The formula for estimating the mean of grouped data is given as

- A. $\sum \frac{n}{x}$
- B. $\frac{\sum f}{n}$
- C. $\frac{\sum fx}{\sum f}$

46. Find the mode in the following data set (11,12,13,14,14)
- a. 11
 - b. 12.8
 - c. 13
 - d. 14
47. Which of the following is not a measure of central tendency
- a. Mean
 - b. Mode
 - c. Range
 - d. Median
48. Standard deviation is the square root of
- a. Mode
 - b. Standard error
 - c. Variance
 - d. Regression
49. The stages of a malignant disease (cancer) is recorded using the symbols 0, I, II, III, IV.
We say that the scale used is:
- a. Alphanumeric
 - b. Numerical
 - c. Ordinal
 - d. Nominal
50. The characteristics or quantity that may vary from one individual to another is called
- a. Statistics group
 - b. Variable
 - c. Dynamic group
 - d. Dynamism

SECTION B

Answer question 1 and other one question (2 or 3). Section A carries 20 marks and the others carry 10 marks each.

1. Ms. Sandra Amuzu, a final year student of CSUC is writing her research thesis on anaemia in pregnancy at the ANC clinic at Suntreso Government Hospital. In line with the academic requirement, she is required to collect her data, analyse and present her work before she can be part of the graduating class in June 2019. She discussed with Haruna who advised her to interview 100 people since there is not much time. In your literature work, you chanced on an article that was published by Williams Boakye at KATH which reported a prevalence of anaemia in pregnancy to be 32.5%.
 - A. With 95% confidence interval, and an error margin of 3%, advise her on the appropriate sample size to use.
 - B. Which sampling method(s) or technique can she use to obtain her sample? Describe how this will be done.
 - C. What will be the advantage of such a method or technique?
 - D. Indicate how she would ensure internal and external validity of such a study.

2. An observational study was conducted among students at the Christian Service University College to ascertain the perception of their own body. The study employed a random sampling technique with 1200 students. The main variable was “perception of body image” with three options (overweight, underweight, and about right). Study the figure carefully and answer the questions below.

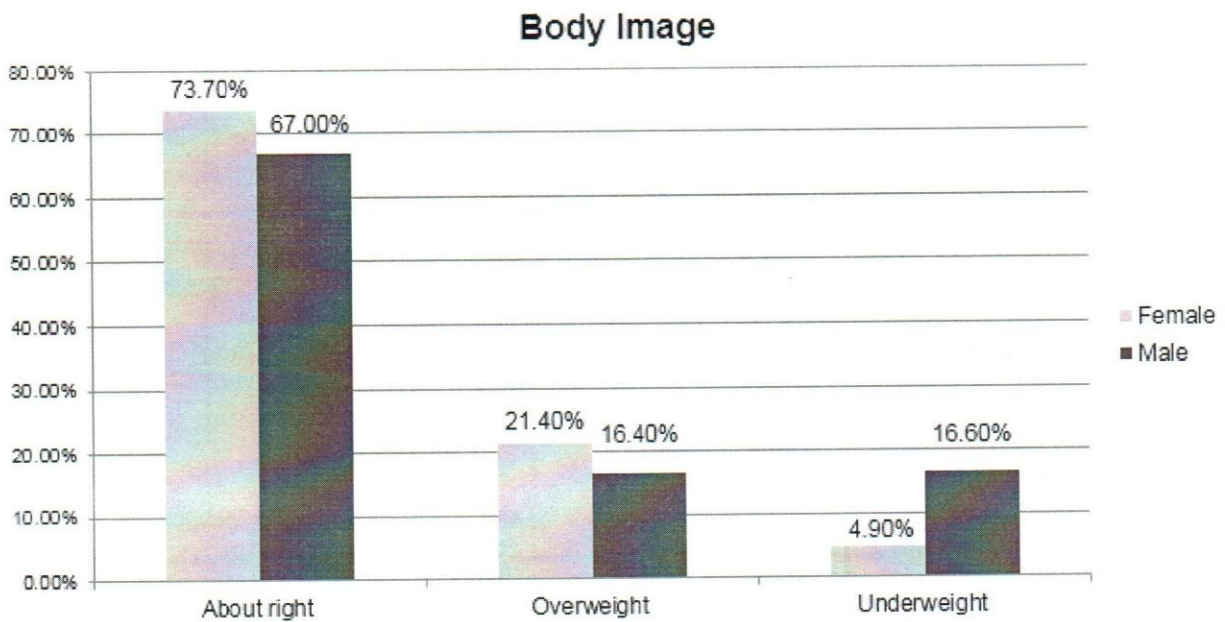


Figure 1: Students’ perception of their weight.

- A. What scale can be used to measure the variable studied? Write the key characteristics of the selected scale and why that fits the current variable under study.
- B. Interpret figure 1 as a narrative to be included in the University Health bulletin (Do not write more than 1 paragraph). (10 marks)

3. Disability Adjusted Life Years (DALY's) is an economic measure used to determine the burden of diseases. In 2016, Mr. Stephen Osei Kofi and Ms. Sarah Donkor lead a team of students from the Christian Service University College to undertake a study on "the economic burden of pneumonia among children less than 5 years reporting at Komfo Anokye Teaching Hospital". The analysis of the data was done in STATA and it is presented in Figure 2 below.

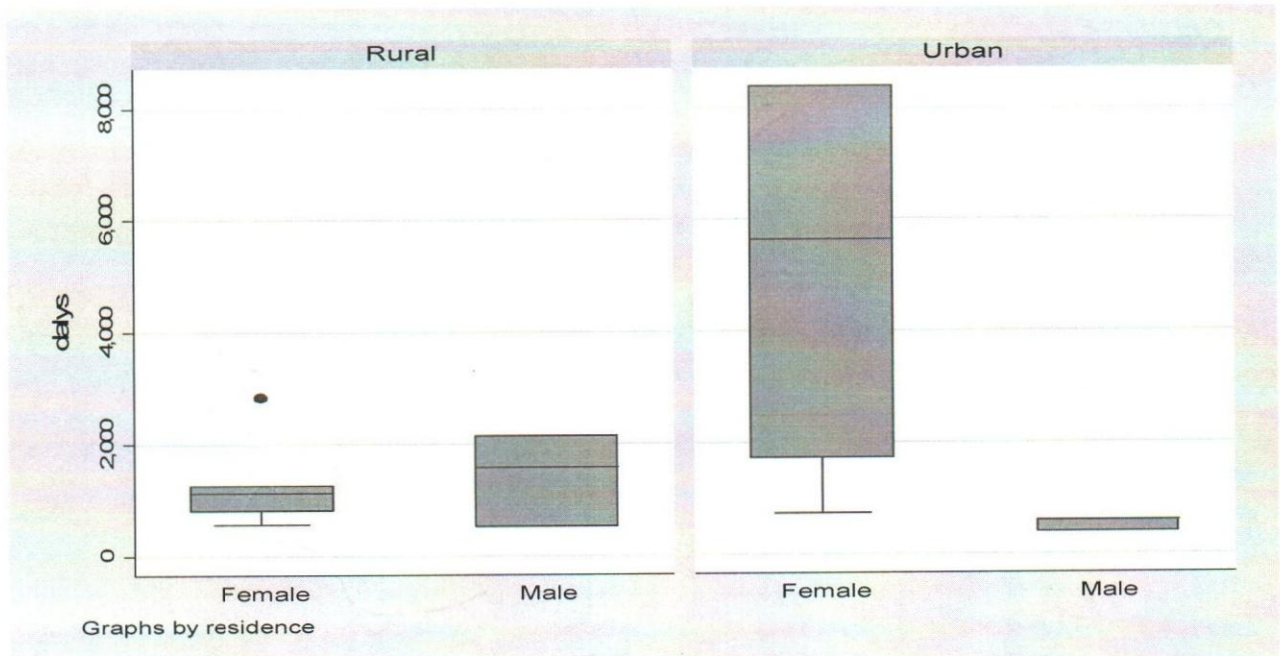


Figure 2: DALY's caused by pneumonia by sex and residential status

- A. In not more than one paragraph, interpret figure 2 for a narrative to be considered for publication in the newly launched Physicians Assistants Medical Journal. (10 marks)
- B. Relying on your expertise in Biostatistics, how can Biostatistics be used to address re-emerging infectious diseases in the West African region (Be brief)