

**VINAYAKA MISSION'S RESEARCH FOUNDATIONS, SALEM**  
**(Deemed to be University)**

**M.OPTOMETRY DEGREE EXAMINATION – February 2020**

**First Semester**

**RESEARCH METHODOLOGY AND BIOSTATISTICS**

Time: Three hours

Maximum: 100 marks

I .Choose the best answer (20 x 1 = 20)

1. A researcher selects a probability sample of 100 out of the total population. It is
  - a) A cluster sample
  - b) A random sample
  - c) A systematic sample
  - d) A stratified sample
2. In a week the prices of a bag of rice were 350,280,340,290,320, 310,300. The range is
  - a) 60
  - b) 70
  - c) 80
  - d) 100
3. Tables and graphs are important tools for which tasks of an epidemiologist?
  - a) Data collection
  - b) Data summarization (descriptive epidemiology)
  - c) Data analysis
  - d) Data presentation
4. A table in a report or manuscript should include:
  - a) Title
  - b) Row and column labels
  - c) Footnotes that explain abbreviations, symbols, exclusions
  - d) Source of the data
  - e) Explanation of the key findings
5. \_\_\_\_ A wide range of values can be plotted and seen clearly, regardless of magnitude
  - a. Arithmetic-scale line graph
  - b. Semilogarithmic-scale line graph
  - c. Both
  - d. Neither
6. The y-axis tick labels could be 0.1, 1, 10, and 100
  - a. Arithmetic-scale line graph
  - b. Semilogarithmic-scale line graph
  - c. Both
  - d. Neither

7. \_\_\_\_ Can plot numbers or rates
  - a. Arithmetic-scale line graph
  - b. Semilogarithmic-scale line graph
  - c. Both
  - d. Neither
8. \_\_\_\_ Columns can be subdivided with color or shading to show subgroups
  - a) Histogram
  - b) Bar chart
  - c) Both
  - d) Neither
9. Which of the following shapes of a population pyramid is most consistent with a young population?
  - a) Tall, narrow rectangle
  - b) Short, wide rectangle
  - c) Triangle base down
  - d) Triangle base up
10. \_\_\_\_ Y-axis shows percentages from 0% to 100%
  - a. Cumulative frequency curve
  - b. Survival curve
  - c. Both
  - d. Neither
11. \_\_\_\_ Plotted curve usually begins in the lower left corner
  - a. Cumulative frequency curve
  - b. Survival curve
  - c. Both
  - d. Neither
12. \_\_\_\_ Horizontal line drawn from 50% tick mark to plotted curve intersects at median
  - a. Cumulative frequency curve
  - b. Survival curve
  - c. Both
  - d. Neither
13. Compared with a scatter diagram, a dot plot:
  - a. Is another name for the same type of graph
  - b. Differ because a scatter diagram plots two continuous variables; a dot plot plots one continuous and one categorical variable
  - c. Differ because a scatter diagram plots one continuous and one categorical variable; a dot plot plots two continuous variables
  - d. Plots location of cases on a map

14. \_\_\_\_ Number of cases of dog bites over time
- Grouped bar chart
  - Histogram
  - Line graph
  - Pie chart
15. \_\_\_\_ Number of cases of dog bites by age group (adult or child) and sex of the victim
- Grouped bar chart
  - Histogram
  - Line graph
  - Pie chart
16. \_\_\_\_ Number of cases of dog bites by breed of the dog
- Grouped bar chart
  - Histogram
  - Line graph
  - Pie chart
17. \_\_\_\_ Number of cases of dog bites per 100,000 population over time
- Grouped bar chart
  - Histogram
  - Line graph
  - Pie chart
18. Process of converting inputs into outputs in presence of repeatedly same conditions is classified as
- sampler
  - parameters
  - process
  - mixer
19. The Wilcoxon Rank Sum test
- requires two independent samples
  - may be used only for one-sided alternatives
  - compares paired random samples from one population
  - makes the assumption that samples are selected from normally distributed populations
20. When creating a bar chart, the decision to use vertical or horizontal bars is usually based on:
- The magnitude of the data being graphed and hence the scale of the axis
  - Whether the data being graphed represent numbers or percentages
  - Whether the creator is an epidemiologist (who almost always use vertical bars)
  - Which looks better, such as whether the label fits below the bar

**II .Write an Essay on:**

(4 x 10 = 40)

21. Methods of data collection.
22. Types of variables.
23. Difference between diagrams and graphs.
24. Explain Anova

**III .Write an Long Essay on :**

(2 x 20 = 40)

25. Types of correlation.
26. Calculate mean and median for the following data mode and range  
Values : 13,18,13,14,13,16,14,21,13.

Use the Wilcoxon Rank Sum test on the data in the following table to determine whether the location of the population A is to the left of the location of population

B. Use  $\alpha = 0.05$ .

- a) 75 60 73 66 81
- b) 90 72 103 82 78

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