MEDICAL UNIVERSITY – PLEVEN, FACULTY OF PUBLIC HEALTH
MEDICAL STATISTICS – TEST 1

Name……………………………………………………

Fac. №……….…Group…………..…Date…………..…

1. Stratified random sampling involves the selection of the most accessible elements of the population.
   A. True   B. False

2. A sample is said to be random when it is not representative of the population.
   A. True   B. False

3. The levels of measurement which have equal intervals are:
   A. the nominal and ordinal scales
   B. the ordinal and ratio scales
   C. the interval and ratio scales
   D. the ratio and nominal scales

4. The readings "64 kilograms" is a value on a(n):
   A. ratio scale   B. interval scale   C. ordinal scale   D. nominal scale

5. Frequency distributions of continuous data can be presented graphically as histograms or frequency polygons.
   A. True   B. False

6. With a bell-shaped or normal distribution, most of the scores are located at the two extreme ends of the distribution.
   A. True   B. False

7. If a curve is negatively skewed, the distribution of the scores has a 'tail' towards the lower values of the variable.
   A. True   B. False

8. Nominal and ordinal data are best graphed as histograms.
   A. True   B. False

9. Which of the following statements is true?
   A. The mode is the most useful measure of central tendency.
   B. The variance is the square root of the standard deviation.
   C. The median and the 50th percentile rank have different values.
   D. The mean is more affected by extreme scores than the median.

Case study 1: The total number of deaths reported in a hypothetical country for a given year was 120 000. The following deaths by cause as a percentage of all deaths:

Heart disease	35%
Cancer	25%
Cerebro-vascular disease	15%
Trauma	10%
Respiratory disease	5%
Infections	5%
Other causes	5%

Questions 10-12 refer to this data.

10. The variable "cause" of death' is measured on a(n):
    A. nominal scale   B. ordinal scale   C. interval scale   D. ratio scale

11. The above data should be graphed as a:
    A. frequency polygon
    B. histogram
    C. bar or pie graph
    D. A and B

12. Of the people who died of trauma, the male: female ratio was 2:1. How many females died of trauma?
    A. 4000
    B. 8000
    C. 12 000
    D. insufficient information to calculate answer

13. Given a normal distribution the mean, mode and median are equivalent.
    A. True   B. False

14. When a distribution consists of very different scores, standard deviation will be relatively large.
    A. True   B. False

15. A group of male patients aged 50-59 years has a mean weight of $\overline{X} = 80kg$ and a standard deviation of s = 8 kg. What are the normal group limits in case of seven normative groups?
    A. 72 – 88 kg   B. 80 – 72 kg   C. 76 – 84 kg   D. None of the above

16. When we use Pearson's r, we assume that both variables are continuous and normally distributed.
    A. True   B. False

17. When deciding which coefficient of correlation to employ with a specific set of data, we should consider:
   A. whether the relationship is linear or non-linear
   B. the type of scale of measurement for each variable
   C. A and B
   D. neither A nor B

18. Correlation is defined as the relative difference between two variables.
   A. True   B. False

19. The calculated values of correlation coefficients range between 0 and -1.
   A. True   B. False

20. A scattergram:
   A. is a statistical test
   B. must be linear
   C. must be curvilinear
   D. is a graph of x and y scores

21. In a 'negative' relationship:
   A. as x increases, y increases
   B. as x decreases, y decreases
   C. as x increases, y decreases
   D. both A and B

22. The degrees of freedom (df) for χ^2 are determined by the formula:
   A. df = n – 1   B. df = n . c – 1   C. df = (r – 1).(c – 1)

23. Compared to a 99% confidence interval, a 95% CI is:
   A. larger
   B. smaller
   C. more likely to contains the population mean
   D. less likely to contain the sample mean.

Case study 2: A random sample of 25 clients is selected, and their systolic blood pressures measured. The mean BP is 115 mmHg, with a standard deviation of 10.
Use this information to answer questions 24-26.

24. What is the standard error of the mean for a sample of this size?
   A. 10   B. 20   C. 2   D. 2.5

25. In order to calculate the 99% confidence interval of the mean, what *t* score will be used?
   A. 2.492   B. 2.787   C. 2.797   D. 1.711

26. What is the 99% confidence interval of the mean in this sample?
 A. 110.0 ÷ 120.0   B. 109.4 ÷ 120.6   C. 111.6 ÷ 118.4   D. 113.0 ÷ 117.0

27. True statements concerning Student's t test and the t distribution include all of the following EXCEPT
 A. Student's t test is appropriate for sample sizes of fewer than 30
 B. as the sample size increases, the t value approaches the value of the critical ratio
 C. the t distribution reflects less variation due to chance than does the normal distribution
 D. the probability value derived from a t value depends on the number of degrees of freedom
 E. proportions can be used in calculating the t value

28. Determine the statistical significance between the average weight of newborn males (3400 g) and newborn females (3250) if the degree of freedom is df (k) = ∞ and t = 2.85.
 A. there is a significant difference between the means
 B. there is no significant difference between the means

Case study 3: An investigator is interested in the variables affecting smoking in a college population. The smoking-on-campus study produced the following data:
Use this information to answer questions 29-30.

	Males	*Females*	*Total*
Smokers	*120*	*80*	*200*
Non-smokers	*130*	*170*	*300*
Total	*250*	*250*	*500*

29. What is the χ^2 value:
A. 13.4   B. 5.6   C. 7.9   D. 19.6

30. With the χ^2 value that you have found in question 29 and df = 1, the difference between the compared groups is:
A. due to chance   B. statistically significant   C. not statistically significant

Right answers …… Mistakes …… Final mark ……… Examiners: 1.
 2.