Port- Said University Date;

Faculty of nursing Time allowed

**Fourth year Biostatistics final exam 2022 (60 Marks)**

**Choose the correct answer (one mark each)**

**1.** **Which of the following type of the diagrams can be used to find out the relationship between two variables?**

1. Pictogram c. Bar diagram
2. Histogram d. scatter diagram

**2. Calculate the mode of 11, 18, 12, 33, 12, 32, 52**

1. 11 b. 11.5 c. 12 d. 52

**3. To label a statistical test definitely significant, the p-value should be**

a) Less than 0.05 b) Less than 0.5

c) greater than 0.05 d) greater than 0.5

**4. A study was conducted for the comparison of mean systolic blood pressures in independent samples of pregnant and non-pregnant women. Choose the most appropriate statistical test**

1. Chi-square analysis
2. Student t test
3. Paired t test
4. Analysis of variance

**5. If null hypothesis is rejected even if it is true is**

1. type I error
2. type II error
3. β error
4. µ error

**6. Normal curve is**

1. Linear
2. Symmetrical
3. Curvilinear
4. Parabolic

**7. Normal distribution curve depends upon**

1. Mean and sample
2. Mean and median
3. Mean and standard deviation
4. Median and standard error
5. **All the following are measures of central tendency, except:**
6. Mean
7. Median
8. Mode
9. Variance
10. **The degree of flatness or peakedness of a graph of a frequency distribution is termed as:**
    1. standard deviation
    2. kurtosis
    3. skewness
    4. mode

**10.Which statement about normal distribution is FALSE:**

* 1. 50 percent of the observations fall within one standard deviation sigma of the mean.
  2. 68 percent of the observations fall within one standard deviation sigma of the mean.
  3. 95 percent of observation falls within 2 standard deviations.
  4. 99.7 percent of observations fall within 3 standard deviations of the mean.

**11. Chi-square test is used to test:**

1. Difference in proportions
2. Difference in means of two independent variables
3. Relationship between two bivariate variables
4. Difference in means of three or more set of variables

**12. A hypothesis test is done in which the alternative hypothesis is that more than 10% of a population is left-handed. The p-value for the test is calculated to be 0.25. Which statement is correct?**

1. We can conclude that more than 10% of the population is left-handed.
2. We can conclude that more than 25% of the population is left-handed.
3. We can conclude that exactly 25% of the population is left-handed.
4. We cannot conclude that more than 10% of the population is left-handed.

**13. Skewness is a measure:**

1. of the asymmetry of the probability distribution
2. decides the distribution may have high or low variance
3. of central tendency
4. None of the above

**14. Cholesterol value are obtained in a group of people before and after giving drug A. the appropriate statistical test used to analyze the data is:**

1. Paired t-test
2. Unpaired t-test
3. Fischer's test
4. Chi-square test

***15. Cardiac patients who receive support from former patients have less anxiety and higher self-efficacy than other patients"*. This statement is an example of:**

1. Directional hypothesis
2. Non-directional hypothesis
3. Statistical hypothesis
4. Null hypothesis

**16. What is *TRUE* about research hypothesis?**

1. States there is no relationship between the variables.
2. Statement about the expected relationship of the variables.
3. States a negative relationship between the variables
4. Research hypothesis should always be directional.

**17. Type I error refers to:**

1. Rejecting H0 when it is actually true
2. Accepting H0 when it is actually false
3. Concluding no difference when one does exist
4. Rejecting research hypothesis when H0 is actually false
   1. **A graph that uses vertical bars to represent data is called a \_\_\_\_.**
   2. Line graph
   3. Bar graph
   4. Scatterplot
   5. Vertical graph
   6. **Bar charts may be distinguished from histograms at a glance because:**
   7. bar charts are not used for time series data
   8. histograms are used to display discrete data
   9. bar charts are based on area under the curve
   10. histograms do not have spaces between consecutive columns
   11. **Systolic blood pressure is normally distributed in a population with a mean of 120 mmHg and standard deviation of 5 mmHg. The middle 95% of that population have a systolic blood pressure between**
5. 110 mmHg and 140 mmHg
6. 110 mmHg and 120 mmHg
7. 110 mmHg and 130 mmHg
8. 110 mmHg and 140 mmHg
   1. **Sex, smoking and disease status is considered:**
9. Discrete variable
10. Ordinal variable
11. Binary variable
12. Continuous variable
13. Nominal variable
    1. **Nationality is considered:**
14. Discrete variable
15. Ordinal variable
16. Binary variable
17. Continuous variable
18. Nominal variable
    1. **Celsius temperature scale is considered:**
19. Discrete variable
20. Ordinal variable
21. Binary variable
22. Continuous variable
23. Nominal variable
    1. **number of accidents in a city is considered:**
24. Discrete variable
25. Ordinal variable
26. Binary variable
27. Continuous variable
28. Nominal variable
    1. **Social class is considered:**
29. Discrete variable
30. Ordinal variable
31. Binary variable
32. Continuous variable
33. Nominal variable
    1. **Number of children in the family is considered:**
34. Discrete variable
35. Ordinal variable
36. Binary variable
37. Continuous variable
38. Nominal variable

**27. The following are true about the histogram - Except one :**

a) Used for nominal variables

b) The bars are placed side by side

c) The total area is 100%

d) The population pyramid is an example of the histogram

**28. You read in a paper that a p value is 0.01. Is this result clinically significant?**

1. Yes
2. No
3. Cannot tell

**29. A statement about a population developed for the purpose of testing is called:**

(a) Hypothesis(b) Hypothesis testing (c) Level of significance (d) Test-statistic

**30.The variable which is influenced by the intervention of the researcher is called:**

1. Independent
2. Dependent
3. Discrete
4. Extraneous
5. Confounding factor

**31. A result is called “statistically significant” whenever**

1. The null hypothesis is true.
2. The alternative hypothesis is true.
3. The p-value is less than or equal to the significance level.
4. The p-value is larger than the significance level.

**32. Which of the following can have more than one value?**

1. The mean
2. The range
3. The mode
4. The median

**33. The** **algebraic relationship between the variance and standard deviation is that:**

1. The variance is the square root of the standard deviation
2. The standard deviation is the square root of the variance
3. The standard deviation is the variance divided by the square root of n
4. The variance is the standard deviation divided by the square root of
   * 1. **Hypothesis is not tested by:**
5. Descriptive studies
6. Analytical studies
7. Case control studies
8. Cohort studies
   * 1. **A research question:**
9. Describes the research findings.
10. Focuses and guides the research project.
11. Invites other researchers to join the research project.
12. Explains what the researcher is looking for.
    * 1. **An analysis of the race of patients who visit an emergency room reveals that 40% are white, 25% are black, 20% are Native American, and 15% are Asian. These data would best be depicted graphically with a**
13. Cumulative frequency graph
14. Normal curve
15. Histogram
16. Pie chart
    * 1. **Typhoid fever cases were reported throughout the world during the year 2000 – 2020 excluding African region. These cases can be best represented by:**
17. Frequency polygon
18. Histogram
19. Line graph
20. Pictogram
    * 1. **In a particular trial, the association of lung cancer with smoking is found to be 40% in one sample and 60% in another. What is the best test to compare the results?**
21. Chi Square Test
22. Fischer Test
23. Paired t Test
24. ANOVA Test
    * 1. **All are true about P-value except**
25. Is the probability of committing Type-I error
26. Is equal to 1-b
27. Is the chance that the presence of difference is concluded when actually there is none
28. When P-value is less than a, the result is statistically significant

**40.** **In a medical journal report, the observed mortality of smokers and nonsmokers for laryngeal squamous cell carcinoma was reported to be significant at p < 0.05. Such a statement means that**

a) The investigator is rejecting the null hypothesis even though the results could have occurred purely by chance a maximum of 5 times out of 100.

b) There is a difference between the mortality rates of smokers and nonsmokers 5% of the time

c) The null hypothesis claims that there is a difference between the mortality rates of smokers and nonsmokers.

d) A causal relationship between smoking and mortality may be established through this study

e) There is insufficient data, as the total number of smokers and nonsmokers were not given

**41. Which of the following is a nonparametric "Analysis of Variance"?**

1. Mann-Whitney U test
2. Wilcoxon Rank test
3. Kruskal-Wallis test
4. Friedman's test

**42. A variable that is presumed to cause a change in another variable is called**

1. Categorical variable
2. Dependent variable
3. Independent variable
4. Intervening variable

**43. If the assumed hypothesis is tested for rejection considering it to be true is called?**a)Null Hypothesisb) alternative Hypothesis  
c) Simple Hypothesis  
d) Composite Hypothesis

**44.** **Which of the following p-values will lead us to reject the null hypothesis if the significance level of the test if 5%?**

* 1. 0.15
  2. 0.10
  3. 0.20
  4. 0.025

**45. In a negatively skewed distribution, the mean generally falls to:**

1. the left of the median and the median usually lies to the left of the mode.
2. the right of the median and the median usually lies to the right of the mode.
3. the middle of median and mode.
4. the centre of the distribution.
5. **In a standard normal curve the area between one standard deviation on either side will be:**
6. 68%
7. 85%
8. 97.5%
9. 99%

**47. Negatively skewed distribution causes:**

1. Median is more than mean
2. S.D. is more than variance
3. "Tail" to the left
4. "Tail" to the right

**48.If serum cholesterol in apparently healthy individuals is normally distributed with mean =180 mg% and standard deviation = 4 mmHg, the probability to find an individual from that population whose serum cholesterol is above 176 mg% is equal to**

1. 54%
2. 84%
3. 74%
4. 94%
5. 34%
6. **Comparison of serum cholesterol before and after ingestion of hamburgers in a sample of fast-food customers the most appropriate statistical test to analyze the data is**
7. Chi-square analysis
8. Student *t* test
9. Paired *t* test
10. Analysis of variance
11. Linear regression
12. **Right sided skewed distribution causes:**
13. Median is more than mean
14. S.D. is more than variance
15. "Tail" to the left
16. "Tail" to the right
17. **An investigator was to study the association between maternal intake of iron supplements (yes or no) and birth weights (in grams) of newborn babies. He collects relevant data from 100 pregnant women and their newborns. What is the appropriate statistical investigation in this context?**
18. Chi-square test
19. Unpaired or independent t-test
20. Analysis of variance
21. Paired t-test
22. **. Regarding paired t-test true is:**
23. Hypertension in a person before and after treatment can be studied
24. Continuous variables in a single sample
25. Different variables in a single sample
26. Unrelated samples can be compared
27. **What is not true about range?**
28. Range equals to the difference between highest and lowest scores
29. Range is inclusive of the two extreme scores
30. Range is a measure of dispersion
31. Range equals to the standard error of mean
32. **Frequency of change in position of incontinent patients is related to the development of decubitus ulcers**
33. complex hypothesis
34. Directional hypothesis
35. non-directional hypothesis
36. Null hypothesis
37. **No difference in mortality between patients using drug A and patients not using drug A.**
38. complex hypothesis
39. Directional hypothesis
40. non-directional hypothesis
41. Null hypothesis
42. **Individuals that smoke cigarettes and live in cities are more likely than others to have respiratory problems and increased cancer.**
43. Simple hypothesis
44. complex hypothesis
45. Null hypothesis
46. non-directional hypothesis

**57. ……. is a line chart presenting the cumulative frequency of a continuous variable**

1. line graph
2. frequency polygon
3. ogive
4. histogram
5. scatter plot

**58. In a positively skewed distribution the mean is usually near the tail and is the largest value among the measures of central tendency**

a) true b) false

**59. Bar chart and Pie chart are used to represent qualitative data graphically**

a) true b) false

**60. If a statistical test is carried out at the α= .01 level of significance, which of the following state­ments most accurately describes the probable validity of the conclusion?**

1. The probability of rejecting a true H0 is .01
2. The probability of accepting HA when it is, in fact, true is .01
3. The probability of rejecting H0 when it is indeed false is .01
4. The probability of rejecting H0 is greater than it would be if α were equal to .05