

Course No: DNTS 1207  
Course Title: Applied Statistics  
Date: 27/3/2013  
No. of Questions: (5)  
Time: 1hour  
Using Calculator (yes)

University of Palestine



Midterm Exam  
Second term 2012/2013  
Total Grade: 20 Marks

Instructor Name: Dr. Amjad El-Shanti  
Student No.: \_\_\_\_\_  
Student Name: \_\_\_\_\_  
College Name: Faculty of Dentist and Oral Surgery  
Dep./Specialist: \_\_\_\_\_  
Using Dictionary (No)

**Question One : (2.5 marks)**

**Put the sign (✓) against the right sentences and the sign (X) against the wrong sentences:**

- 1- A comprehensive survey is considered a new census ( ).
- 2- Ordered presentation (Array) can be used for qualitative ordinal variables ( ).
- 3-The Bar graph is the most suitable to represent the quantitative discrete variables ( ).
- 4-The simple and effective way of describing two quantitative variables is the line graph ( ).
- 5-The midrange is a rough measure of dispersion since it neglects all intermediate observations ( ).
- 6- The median could be computed whether the table is open or closed ( ).
- 7- Standard deviation is the average of the squared deviation from the mean ( ).
- 8- The advantage of the standard unit transformation is that it takes into account both the mean value and the variability in a set of raw scores ( ).
- 9- The normal curve can be used to answer questions concerning the probability of events ( ).
- 10- If the sample is normal, the sampling distribution of means will be normal only with large sample size ( ).

**Question Two: (5 marks)**

**Select the correct answer from the following alternatives for each sentence:**

- 1- **A statistics professor asked students in a class their ages. On the basis of this information, the professor states that the average age of all the students in the university is 21 years. This is an example of:**
  - a. a census
  - b. descriptive statistics
  - c. an experiment
  - d. statistical inference
  - e. None of the above answers is correct.
- 2- **A tabular summary of a set of data showing the fraction of the total number of items in several classes is a:**
  - a. frequency distribution
  - b. relative frequency distribution
  - c. frequency
  - d. cumulative frequency distribution
  - e. None of the above answers is correct.
- 3- **The standard deviation of a sample of 100 observations equals 64. The variance of the sample equals:**
  - a. 8
  - b. 10
  - c. 6400
  - d. 4096
  - e. None of the above answers is correct.

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- 4- A numerical value used as a summary measure for a sample, such as sample mean, is known as a:
- population parameter
  - sample parameter
  - sample statistic
  - population mean
  - None of the above answers is correct.
- 5- The sum of deviations of the individual data elements from their mean is:
- always greater than zero
  - always less than zero
  - always equal to 1
  - always equal to zero
  - None of the above answers is correct.
- 6- Which of the following is not a measure of dispersion?
- the range
  - the third quartile (Q3)
  - the standard deviation
  - the interquartile range
  - the variance.
- 7- In computing descriptive statistics from grouped data:
- data values are treated as if they occur at the midpoint of a class
  - the grouped data result is more accurate than the ungrouped result
  - the grouped data computations are used only when a population is being analyzed
  - All of the above answers are correct
  - None of the above answers is correct.
- 8- When should measures of location and dispersion be computed from grouped data rather than from individual data values?
- as much as possible since computations are easier
  - only when individual data values are unavailable
  - whenever computer packages for descriptive statistics are unavailable
  - only when the data are from a population
  - None of the above answers is correct.
- 9- Which of the following do not apply to normal distribution :
- it is symmetric and bell shaped
  - mean=median=mode
  - unimodal
  - area under curve=1
  - All of the above answers are correct.
- 10- The mean of a distribution is 23, the median is 24, and the mode is 25.5. It is most likely that this distribution is:
- negatively skewed
  - positively skewed
  - symmetrical
  - asymptotic
  - None of the above answers is correct.

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**11-Data from a rural area of Gaza show that the mean age of stopping breastfeeding is 9 months and the median age is 4.5 months. We can calculate:**

- a. the data rang is 13.5 months
- b. the distribution of breastfeeding duration is not symmetric
- c. approximately 50% of the children breastfeed for 9 months
- d. the mode is greater than mean.
- e. All of the above answers are correct.

**12-Systolic blood pressure (SBP) of a group of students is normally distributed with a mean of 120 mmHg and a standard deviation of 7.5 mmHg. Which of the following statement is FALSE :**

- a. approximately 95% of the students have SBP between 105 and 135 mmHg
- b. approximately 50% have a SBP above 120 mmHg
- c. the distribution of SBP is not bimodal
- d. about 5% of the students have SBP below 120 mmHg
- e. The most SBP recorded among the group of students is 120 mmHg.

**13-In a test, your result is equivalent to a standard unit value (Z) of +0.025. This implies:**

- a. You performed poorly when compared to others
- b. You performed very well when compared to others
- c. Your result was slightly above average
- d. Your result was slightly below average

**14-The following data are the number of brothers for 5 children: 5, 6, 7, 8, and9. Which of the following is CORRECT according to the data:**

- a. The mean= The median= The mode
- b. The mode=0
- c. The coefficient of variation= 50%
- d. The standard deviation=2 brothers
- e. None of the above answers is correct.

**15-The mean of Fasting Blood glucose (FBG) of 20 patients admitted in surgical department of hospital was 80 mg/dl with standard deviation 10 mg/dl. Suppose that the FBG was normally distributed. Which of the following statements is FALSE :**

- a. The proportion of patients who's FBG more than 100mg/dl was 5%
- b. The proportion of patients who's FBS more than 100mg/dl was equal to the proportion of patients who's FBG less than 60mg/dl
- c. The standard unit value of -2 corresponded to FBS value of 60mg/dl
- d. The most frequent FBG was observed among patients was 80 mg/dl
- e. About 10 patients had FBS more than 80 mg/dl.

**16-Which of the following statements is CORRECT according to the following three data sets:**

**Data Set A: (R, B, R, B, R, W, W, W, B, Y)**

**Data Set B: (R, B, R, B, R, W, W, W, B)**

**Data Set C: (R, B, R, Y, B, W, W). Suppose that these letters are the colors of cars in 3 streets**

- a. There are trimodal in data sets A and C only
- b. No mode for any above data sets.
- c. The mode is never determined in like these data sets
- d. The mode for data set B is 0
- e. None of the above answers is correct.

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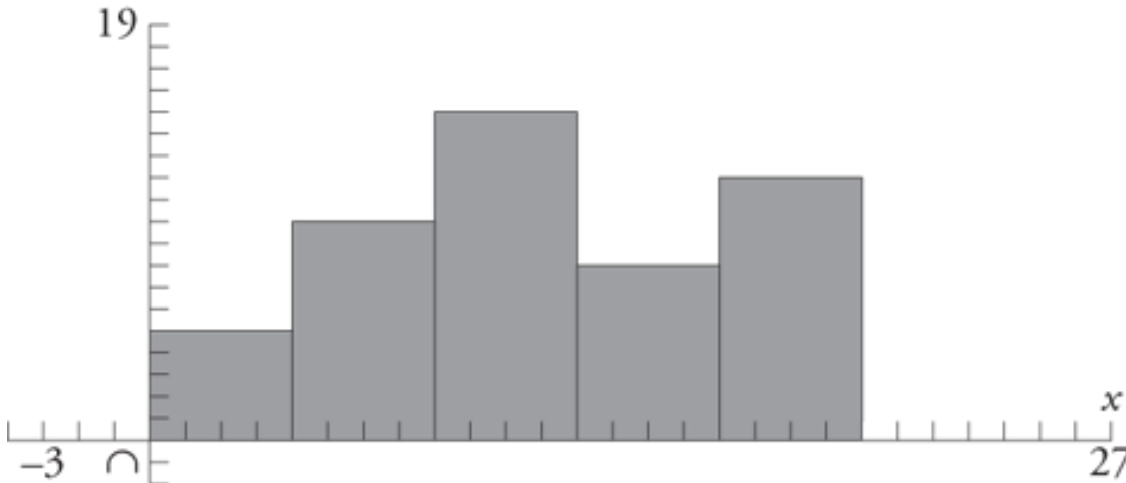
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Using Dictionary (No)

-Use the histogram below showing the frequency for the number of teeth caries for a group of 50 students for questions 17 through 20.



17-The first interval is 0 to 4, that is  $0 \leq x < 4$ . The cumulative frequency for the interval 4 to 8 :

- a. 10
- b. 12
- c. 15
- d. 50
- e. None of the above answers is correct.

18. The relative frequency for the interval 16 to 20 :

- a. 0.12
- b. 0.16
- c. 0.24
- d. 0.48
- e. It is difficult to determine the relative frequency from the histogram.

19. An interval has a cumulative relative frequency of 0.60 :

- a. 0 to 4
- b. 4 to 8
- c. 8 to 12
- d. 12 to 16
- e. 16 to 20

20. If the histogram were changed to a relative frequency histogram, which of these would change:

- a. width of the rectangles
- b. scale on the  $x$ -axis
- c. scale on the  $y$ -axis
- d. All of the above answers are correct
- e. None of the above answers is correct.

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**Question Three: (4.5 marks)**

The following table shows the distribution of 50 children according to the order of child among sibling:

Order of child among sibling	No. of children
1-	4
6-	16
11-	10
16-	17
20-24	3
Total	50

- A- What is the variable here? What is its type? what is the best graph suitable to represent it?
- B- Find the mid-range, median, and arithmetic mean?
- C- Find “the standard deviation” and “coefficient of variation using the semi-inter-quartile range”?
- D- Compute the mode using the lever method?

**Question Four: (3 marks)**

On measuring the cholesterol level by mg/dl of a group of patients admitted in intensive care unit department in governmental hospital, the following data were obtained:

150	174	147	162	168	156	158	158	150	154
136	171	166	157	172	154	147	179	160	153
159	162	157	159	163	164	170	172	168	156

- A- Construct a simple frequency distribution table using width interval=10?
- B- Determine the mode of patients’ cholesterol level using the graphical method?
- C- Determine the distribution of cholesterol level of patients in intensive care unit in governmental hospital whether normal or skewed, justify your selection?

**Question Five: (5 marks)**

Suppose the following data which represents the number of extracted teeth of 20 children in the dentist clinic were normally distributed:

5	8	5	4	6	9	6	5	6	4
7	6	10	7	3	5	4	2	10	8

- A- What proportion of children who have number of extracted teeth more than 5 teeth?
- B- What is the standard unit (Z) which corresponds the number of extracted teeth equal 9?
- C- What proportion of children who have number of extracted teeth between 4 to 10 teeth?

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\*You can use the following Formulae to answer the previous questions:

- % of category= (Frequency of category/total frequency) X 100
- Sectoral angle= (Frequency of each category/ Total frequency)X 360
- Mid rang= (Smallest observation- Largest observation)/2
- Force X Length (x) = resistance X (total length-x)
  
- Median= Lower limit of median interval + (Special rank X width of median interval/observed frequency of median interval)
- $\bar{X} = \frac{\sum X_i}{n}$  Or  $\bar{X} = \frac{\sum f_j X_j}{\sum f_j}$
- $S = \sqrt{\frac{\sum X_i^2 - \frac{(\sum X_i)^2}{n}}{n-1}}$  Or  $S = \sqrt{\frac{\sum f_j X_j^2 - \frac{(\sum f_j X_j)^2}{\sum f_j}}{\sum f_j - 1}}$
- $CV = \frac{S}{\bar{X}} \times 100$  Or  $CV = \frac{SIQR}{Q2}$
- $SIQR = \frac{Q3 - Q1}{2}$
- $Z = \frac{X - \bar{X}}{S}$

**N.B:** \*Answer all the questions in the answer sheet.

\*Table A: Areas under the normal curve is attached to the questions' paper

End of Questions  
*Good Luck*

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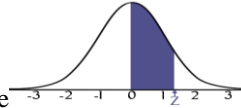


Table A: Standard Normal Distribution Table

	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990