



UNIVERSITY OF JAFFNA, SRI LANKA
FIRST YEAR SECOND SEMESTER BASIC SCIENCES EXAMINATION – JAN 2016

AHSBS1211 BASIC STATISTICS

Date: 10.02.2016

ANSWER FOR ANY TWO QUESTIONS

You may use scientific calculator

Time: 2 Hours



1.

A. Calculate the mean of the following numbers?

10, 39, 71, 39, 76, 38, 25

(15 Marks)

B. Staff from two companies were randomly selected for a study. The staff were asked firstly whether they use alcohol or not; then their aminotransferase (ALT) levels were measured in international units per liter. The summaries are given below. Let the variables X and Y be the ALT value of the alcohol users and non-users, respectively.

	Company I	Company II
Number of Staff	150	200
Mean of X (ALT value of alcohol users)	22.71	24.98
Mean of Y (ALT value of non-alcohol users)	31.02	30.52
Standard Deviation of X	0.311	0.420
Standard Deviation of Y	0.277	0.351
Correlation Coefficient between X and Y	0.761	0.811

- Calculate the combined mean of X , the combined mean of Y . (10 Marks)
- Calculate the combined standard deviation of alcohol users and the combined standard deviation of non-alcohol users. (20 Marks)
- Calculate respective coefficient of variations to the above and comment on them. (20 Marks)

C. A random sample of employees in a pharmacy was asked to state the number of months of service with the pharmacy. Classified results are given below.

Find Mean, Median and Mode for the data.

(35 Marks)

Number of Months of Service	Number of Employees
15-24	4
25-34	11
35-44	19
45-54	14
55-64	6
65-74	2

2.

A. State whether each of the following is quantitative or qualitative; also classify each of the variable by continuous, discrete, ordinal or nominal.

- i. Taking time for 60 heart beats (in seconds) (05 Marks)
- ii. The number of patients arriving to OPD every day for a month (05 Marks)
- iii. Type of drug use (none, infrequent, moderate, or frequent) (05 Marks)
- iv. Season of birth (spring, summer, fall, or winter) (05 Marks)

B. Test scores of 50 students in a class are as follows:

75 88 47 66 78 45 75 66 77 93
 64 61 77 87 66 92 86 57 80 70
 52 84 80 79 66 92 74 83 50 84
 65 75 77 79 79 57 63 51 44 59
 84 77 44 81 61 77 57 75 43 52

- i. Find the mean of the test scores. (10 Marks)
- ii. Construct a histogram for the above data, using classes 40-49, 50-59, 60-69 and so on, and comment on the shape of the distribution. (10 Marks)
- iii. Draw an Ogive curve separately to find the median of the data graphically. (10 Marks)
- iv. Draw a pie chart consisting of four parts: poor (40-49), average (50-59), good (60-79), excellent (80-100). (10 Marks)
- v. Comment on the students' performance. (10 Marks)



C. Leading Causes of Hospital Deaths for the years of 2006 and 2012 are given below. [Source: Annual Health Bulletin – 2012, Public Health Service, Sri Lanka]

Disease and ICD (10 th Revision)	2006 (%)	2012(%)
Ischemic heart disease	12.6	14.4
Neoplasms*	9.9	11.6
Pulmonary heart disease and diseases of the pulmonary circulation	10.0	9.0
Cerebrovascular disease	8.9	8.7
Diseases of the respiratory system, excluding diseases of upper respiratory tract	6.9	7.2
Zoonotic and other bacterial diseases	4.9	7.1
Diseases of the urinary system	4.7	6.3
Pneumonia	4.4	5.7
Diseases of the gastro-intestinal tract	6.9	5.4
Symptoms, signs and abnormal clinical and laboratory findings	4.7	4.5
Traumatic injuries	3.8	3.7
Disorders related to short gestation, low birth weight, slow fetal growth and fetal malnutrition	2.3	1.7
Toxic effects of pesticides	3.8	1.5

*Includes deaths reported from the Cancer Hospital (not analysed by site and type of neoplasm).

- i. Find the Coefficient of Rank Correlation between the years 2006 and 2016.
- ii. Write down the conclusion. (30 Marks)

3.

A. Consider the stem and leaf display given below:

Stem	Leaf
2	8 <i>a</i>
3	2 3 4 <i>b</i>
4	9 9 <i>c</i>
5	<i>d</i> 0 1
6	4 5 6
7	2

- i. Find the exact values for *a*, *b*, *c* and *d* (or if not possible, given the range). (20 Marks)
- ii. Find the median value. (05 Marks)

- B. Ministry of health in Sri Lanka specified that the fluoride level must not exceed 1.5 ppm (parts per million). The 35 measurements below represent the fluoride level for the samples of 35 days. Although fluoride levels are measured more than once per day, these data represent the early morning readings for the 35 days sampled.

Class	Frequency
0.70 – 0.74	2
0.75 – 0.79	6
0.80 – 0.84	12
0.85 – 0.89	10
0.90 – 0.99	4
1.00 – 1.04	1

- i. Draw a Histogram and point out the Mode. (10 Marks)
- ii. Draw less than and more than Ogive curves to point out the Median of the data (10 Marks)
- iii. Use your curve to obtain an estimate of
 - a. the lower quartile
 - b. the upper quartile (10 Marks)

- C. Case Fatality Rate from 2009 to 2012 is obtained from the Annual Health Bulletin – 2012, Public Health Service, Sri Lanka and given below:

Year	Reported Dengue Cases	Dengue Deaths	Case Fatality Rate
2009	35 095	346	
2010	34105	246	
2011	28 473	186	
2012	44461	181	

- i. Find the Case Fatality Rate for each year. (05 Marks)
- ii. Draw an appropriate chart for the above table. (20 Marks)
- iii. Write comments based on the data or the graph drawn above. (20 Marks)