Paper 8: Elements of Statistics and Research Methodology - Mid-Sem Exam

MS LIS First Year

February 21, 2017

Instructions: There are 6 questions altogether. You may use a scientific calculator. Marks corresponding to each question is indicated in bold. Answer as many as you can. Maximum score : **40** marks. Maximum time : **1.5 hrs.**

(1) Based on Historical Research give examples for the following topics like origin, growth, development, impact, use, crisis, personality and history in context of LIS.

[**10**]

(2) (a) What is the difference between questionnaire and schedule?

(b) 'Research method and Research Methodology are two different concepts'. Explain why you agree or disagree with this statement.

(c) To estimate the total expenditure of Diwali celebration in ISI in upcoming year, one of the students collected expenditures from past years and made a table (see below). The student wants to estimate the expenditure for 2017. To do this, will he use inductive reasoning or deductive reasoning? Justify your answer with proper explanation.

Year	Expenditure(in INR)
2010	5600
2012	6000
2014	6500
2016	6900

[**3+3+4**]

(3) (a) For a given research statement: *Impact of weather on the use of the traditional (print) library*, identify all the variables which are used in Research.

(b) Provide examples to enunciate the differences and similarities between random sampling and quota sampling.

[**3+3**]

(4) To determine the proportion of people in your area who are smokers, it has been decided to poll people at one of the following local spots:

- a shopping mall
- a bar
- a tennis club

Which of these potential polling places would result in a reasonable approximation to the desired proportion? Justify.

Further, in an appropriate local spot, say 100 people are interviewed, 13 admit to smoking, 73 say that they are non-smokers and 14 do not respond to your questionnaire, what is a reasonable estimate of the proportion of smokers in your area?

Further, suppose your questionnaire also has the following:

- Do you consume liquor?
- What is your age in years (rounded to greatest integer less than or equal to it)?

Assume that 12 among the 13 who admit to smoking also admit to consuming alcohol and have even-numbered age, 60 among 73 non-smokers do not consume alcohol and all the 73 non-smokers have odd-numbered age. Which of the following conclusions about the individuals in your area make sense? Justify.

(a) Individuals who smoke are more likely to consume alcohol.

(b) A person aged 20 is most likely a smoker.

$$[2+2+2+2]$$

(5) A chemical engineer desiring to study the evaporation rate of water from brine evaporation beds obtained data on the number of inches of evaporation in each of 55 July days spread over 4 years. The data are given in the following stem and leaf plot, which shows that the smallest data value was .02 inches, and the largest .56 inches. Find the

Table 1: Stem Plot of evaporation data, Key: $1|1 = 1.1$

Stem and Leaf	
.0	2 6
.1	1 4
.2	1 1 1 3 3 4 5 5 5 6 9
.3	0 0 2 2 2 3 3 3 3 4 4 5 5 5 6 6 7 8 9
.4	0 1 2 2 2 3 4 4 4 5 5 5 7 8 8 8 9 9
.5	2 5 6

(a) sample mean;

(b) sample median;

(c) sample standard deviation of these data.

(d) Do the data appear to be approximately normal?

(e) What percentage of data values are within 1 standard deviation of the mean?

$$[2+2+2+2+2]$$

(6) Two balls, each equally likely to be colored either red or blue, are put in an urn. At each stage one of the balls is randomly chosen, its color is noted, and it is then returned to the urn. If the first two balls chosen are colored red, what is the probability that

(a) both balls in the urn are colored red;

(b) the next ball chosen will be red

$$[3+3]$$