Indian Statistical Institute
Documentation Research and Training Centre
MS(LIS) (2018-20)
Second Semester Final Examination
Paper 8: Elements of Statistics and Research Methodology

Time: 3.00 hrs **Maximum Marks: 60**

Note: All questions are compulsory. This question paper consists of 4 parts. Marks corresponding to each part are printed in bold. Scientific Calculator is allowed. Necessary distribution tables will be provided on demand.

Part A: **5X1**
(This part consists of 5 MCQ questions. Choose the best answer out of the options.)

1. Which is not a referencing style
   a. AMS (American Meteorological Society)
   b. MHRA (Modern Humanities Research Organization)
   c. IEEE (Institute of Electrical and Electronics Engineers)
   d. KELPRO Style

2. The limits of the coefficient of skewness are
   a. ± 1
   b. ± 2
   c. ± 3
   d. $\pm \infty$

3. The sum of squares of deviations is least when measured from
   a. 0
   b. Arithmetic mean
   c. Median
   d. Mode

4. Median of a distribution is 8. What is the mode of distribution while given that the Mode of distribution is twice of its arithmetic mean.
   a. 0
   b. 6
   c. 8
   d. 12

5. What is the coefficient of correlation(r) while given the regression coefficients b_{xy} and b_{yx} as 0.3 and 1.2 respectively
   a. 0.25
   b. 0.36
   c. 0.60
   d. 4.0

Part B: **5X2**

(This part has 5 questions. Answer all the questions.)

6. List out differences between Citation and Reference.
7. Which measure of central tendency will be suitable to compare:
   a. Size of agricultural holdings
   b. Per capita income of several countries
   c. The intelligence of students in a class
   d. Heights of students in two classes
8. Write a note on Type I and Type II error.
9. What is the degree of freedom?
10. Write a short note on Standard Error.

Part C **5X5**

(This part consists of 5 questions. Attempt all the questions.)

11. Do a comparative study between any two reference management tool.
12. What is measurement in the context of research? Explain different types of measurement scales with appropriate examples.
13. A sample of 16 circuits from a large normal population has a mean resistance of 3.30 ohms. Sample standard deviation is 0.35 ohms. Determine a 95% confidence interval for the true mean resistance of the population.
14. A pharmaceutical company is considering the purchase of new bottling machines to increase efficiency. The factory currently makes use of machines that fill cough syrup bottles whose volume of medicine has a standard deviation of 1.8 ml. The new machine they are considering was tested on 25 bottles, producing a batch with a standard deviation of 1.4 ml. Does this machine produce a standard deviation of more than 1.8 ml? (Assuming normal distribution test at 5% significance level).
15. A major political party of India wishes to test if the proportion of its supporters in the four states(A, B, C and D) are the same or not. Party conducts a sample survey of 1000 people in each state and finds that there are 350, 425, 500 and 300 supporters in the sample in the surveyed states. Using this data construct a contingency table and test if the four proportions are the same or not. Level of Significance is 5%.

Part D **10X2**

(This part consists of 3 questions. Attempt any two.)

16. Heights (in inches) of fathers(X) and their sons(Y) is given as follows:

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

   a. Obtain the equations of the lines of regression.
   b. Find the most likely height of X corresponding to the height 75 inches of Y.

17. Set up an analysis of variance table for the following per acre production data for four varieties of paddy, each grown on five plots. Verify if the variety of differences are significant at 5% level also.

Per acre production data				
Plot of land	**Variety of paddy**			
	A	**B**	**C**	**D**
1	6	5	5	7
2	7	5	4	6
3	3	3	3	4
4	8	7	4	5
5	6	5	4	8

18. What is data visualization? Discuss and illustrate various graphical representation techniques in detail.