INDIAN SCHOOL OF BUSINESS

Probability and Statistics using R

Sample Paper

DURATION: **2 HOUR**

General Instructions:

1) All submissions have to be individual, and will be checked through Turnitin for plagiarism.

2) Honor Code violations will be investigated accordingly.

3) Please remember to include your name and ID at the top of the answer script.

4) Describe your solutions in detail (just mentioning the answer is not enough).

5) In your answers, please clearly indicate the question number and sub-question number (if any).

6) There are 5 problems in total. Attempt all problems.

7) Question 5 is to be done using R studio (compulsory).

Question 1

Virat Kohli's scores in the last ten innings are as follows:

78, 94, 134, 56, 2, 67, 89, 152, 26, 42

Based on the above data, compute the expected value and standard deviation of Virat Kohli's batting score.

(8 Marks)

Question 2

The amount of regular unleaded gasoline purchased every week at a gas station near UCLA follows the normal distribution with mean 50000 gallons and standard deviation 10000 gallons. The starting supply of gasoline is 74000 gallons, and there is a scheduled weekly delivery of 47000 gallons.

a. Find the probability that, after 11 weeks, the supply of gasoline will be below 20000 gallons.
b. b. How much should the weekly delivery be so that after 11 weeks the probability that the supply is below 20000 gallons is only 0.5%?

(12 Marks)

Question 3

If the average number of claims handled daily by an insurance company is 5, what proportions of days have less than 3 claims? What is the probability that there will be 4 claims in exactly 3 of the next 5 days? Assume that the number of claims on different days is independent.

(8 Marks)

Question 4

An architect is designing a doorway for a public building to be used by people whose heights are normally distributed, with mean 1 meter 75 centimeter, and standard deviation 7.5 centimeter. How long can the doorway be so that no more than 1 % of the people bump their heads?

(8 Marks)

Question 5

Prepare a brief report consisting of the analysis of the Boston Housing dataset in R (on any two or three variables of different type). Use both the graphical and the numerical summaries. Your report should briefly describe what those summaries tell you, and anything of that particular note (both the univariate and bivariate analysis is required.)

(24 marks)