Kathmandu University
Department of Mathematics

Second In-Semester Exam - 2025 (Missed)

Subject: MATH 208 **FM: 20** **Time: 1 hr**

Attempt ALL questions.

1. The life in hours of a 75W light bulb is known to be normally distributed with a standard deviation of $\sigma = 25$ hours. A random sample of 20 bulbs has a mean lifetime of 1014 hours. [2+2]

(a) Suppose we wanted to be 95% confidence that the error in estimating the mean is less than 5 hours. what sample size should be used?

(b) If we wanted the total width of the confidence interval to be 8 hours, what sample size should be used?

2. Plastic rods are automatically cut into lengths of 6 inches. Actual lengths are normally distributed about a mean of 6 inches and their standard deviation is 0.06 inch.
   a) What proportion of the rods exceeds tolerance limits of 5.9 inches to 6.1 inches? [2]
   b) To what value does the standard deviation need to be reduced if 99% of the rods must be within tolerance? [2]

3. A course in office procedure was given to 10 assistants for performance improvement. They were examined on the basis of a similar test before and after the course. Results are produced below: [4]