**Practice Questions for simulation practical**

1. **Implement the linear congruential method in C or C++ language to generate a sequence of three two-digit random integers. Also try for the given parameters xo=29, a=9, c=49 and m=100**
2. **Consider a machine tool in a manufacturing shop is turning out parts at the rate of one every 5 2 minutes. As they are finished, the parts go to an inspector, who takes 7 3 minutes to examine each one and rejects about 10% of the parts. The factory has 3 inspectors. Develop a block diagram and write the code and implement for simulating the above problem for a) 1000 parts and b) 7 hours using GPSS.**
3. **Implement multiplicative congruential method in C or C++ to generate a sequence of eight two-digit random integers. Also try for the given parameters xo = 5, a = 11 and m = 100.**
4. **Model a barber shop with the following qualities with block diagram and code in GPSS:**

* **The shop contains one barber and one barber’s chair, open for eight hours in a day.**
* **Customers arrive on average every 18 minutes, with the arrival time varying between 12 and 24 minutes.**
* **If the barber is busy, the customer will wait in a queue.**
* **Once the barber is free, the next customer will have a haircut.**
* **Each haircut takes between 12 and 18 minutes, with the average being 15 minutes.**
* **Once the haircut is done, the customer will leave the shop.**

**Based on above scenario answer the following questions:**

* **How utilized is the barber through the day?**
* **How long does the queue get?**
* **On average, how long does a customer have to wait?**

1. **What is calibration of a model? Explain the iterative process of calibration.**

Calibration is a process that provides corrections which make a logger accurate. Calibration services are based on the process of comparison with a reference or standard in order to give set corrections and/or uncertainties characteristic of the instrument being calibrated. The results of the calibration process may be then used in the adjustment of the instrument

1. **Differentiate between chi-square test and KS test for uniformity. Use KS test for uniformity. Use KS test to check for the uniformity for the input set of random numbers given below.0.54, 0.73, 0.98, 0.11,0.68,0.45. Assume level of significance to be Dα=0.0=>0.565.**
2. **Parts are being made at the rate of one every 10 minutes. They are of two types, A and B. And are mixed randomly with about 10% being type B. A separate inspector is assigned to examine each part.Inspection of part A takes 6±2 minutes while B takes 10±2 minutes. Both inspector rejects 10% of parts they inspect. Draw GPSS block diagram to simulate the the above problem for 100 parts.**
3. **Define and develop a Poker test for four-digit random numbers. A sequence of 10,000 random numbers, each of four digits has been generated. The analysis of the numbers reveals that in 5120 numbers all four digits are different, 4230 contain exactly one pair of like digits, 560 contain two pairs, 75 have three digits of a kind and 15 contain all like digits. Use Poker test to determine whether these numbers are independent. (Critical value of chi-square test forα=0.05 and N=4 is 9.49)**