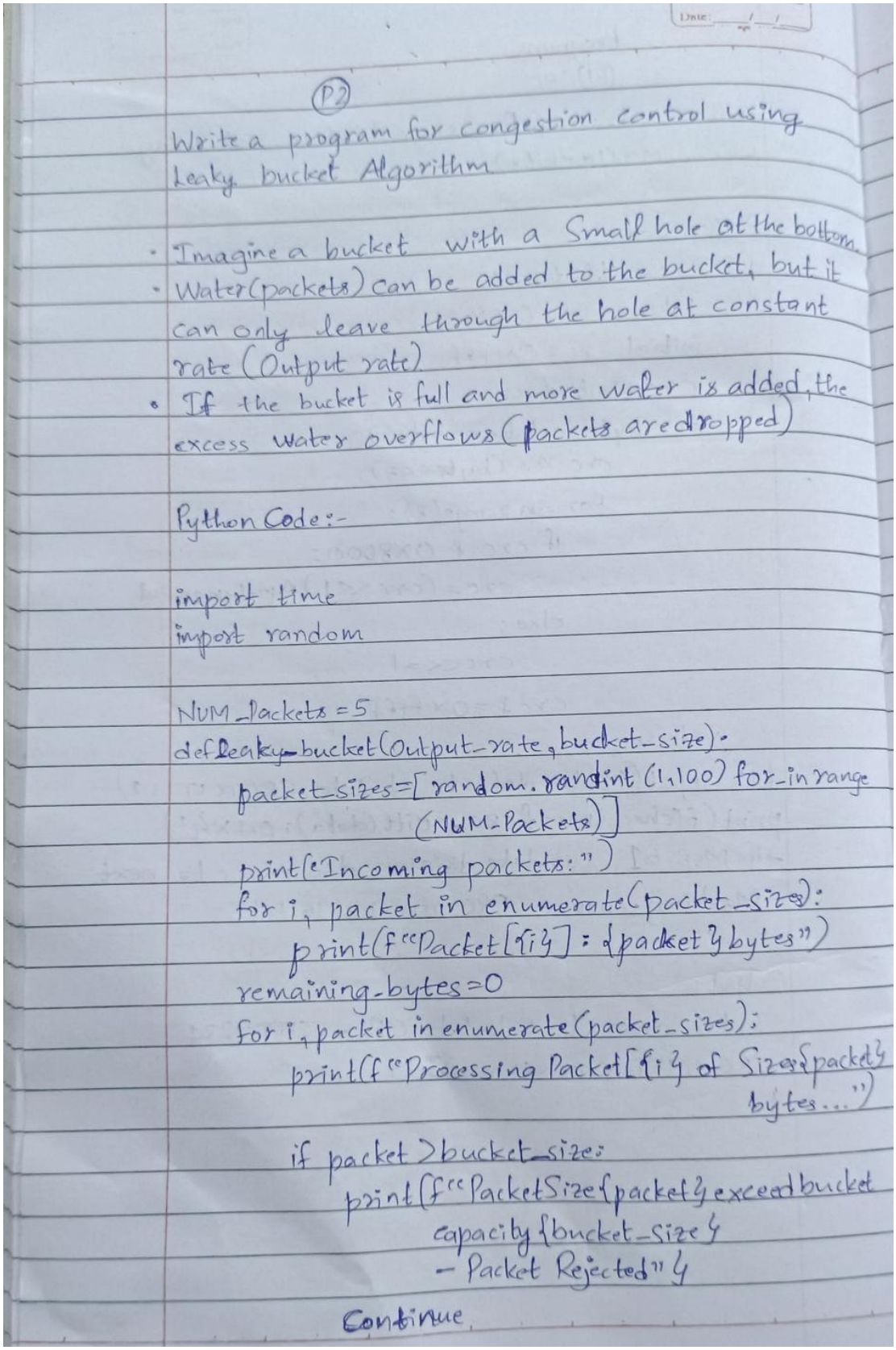
LABORATORY PROGRAM – 2

Write a program for congestion control using Leaky bucket algorithm.



(P2)

Write a program for congestion control using Leaky bucket Algorithm

- Imagine a bucket with a small hole at the bottom.
- Water(packets) can be added to the bucket, but it can only leave through the hole at constant rate (Output rate)
- If the bucket is full and more water is added, the excess water overflows (packets are dropped)

Python Code:-

```
import time
import random

NUM_Packets = 5
def leaky_bucket(Output_rate, bucket_size):
    packet_sizes = [random.randint(1,100) for _ in range
                    (NUM_Packets)]
    print("Incoming packets:")
    for i, packet in enumerate(packet_sizes):
        print(f"Packet[{i}]: {packet} bytes")
    remaining_bytes = 0
    for i, packet in enumerate(packet_sizes):
        print(f"Processing Packet[{i}] of Size {packet}
                                        bytes...")

        if packet > bucket_size:
            print(f"Packet Size {packet} exceed bucket
                  capacity {bucket_size}
                  - Packet Rejected")
        Continue
```

Code

```
# Getting user inputs
storage = int(input("Enter initial packets in the bucket: "))
no_of_queries = int(input("Enter total no. of times bucket content is checked: "))
bucket_size = int(input("Enter total no. of packets that can be accommodated in the bucket:
"))
input_pkt_size = int(input("Enter no. of packets that enters the bucket at a time: "))
output_pkt_size = int(input("Enter no. of packets that exits the bucket at a time: "))

for i in range(no_of_queries):  # space left
    size_left = bucket_size - storage
    if input_pkt_size <= size_left:
        # update storage
        storage += input_pkt_size
    else:
        print("Packet loss =", input_pkt_size)

    print(f"Buffer size = {storage} out of bucket size = {bucket_size}")

    # as packets are sent out into the network, the size of the storage decreases
    storage -= output_pkt_size
```

Output

```
Enter initial packets in the bucket: 0
Enter total no. of times bucket content is checked: 4
Enter total no. of packets that can be accommodated in the bucket: 10
Enter no. of packets that enters the bucket at a time: 4
Enter no. of packets that exits the bucket at a time: 1
Buffer size = 4 out of bucket size = 10
Buffer size = 7 out of bucket size = 10
Buffer size = 10 out of bucket size = 10
Packet loss = 4
Buffer size = 9 out of bucket size = 10
```