SOURCE CODE :

```c
#include <stdio.h>
#include <stdlib.h>

#define MAX 5
int buffer[MAX];
int in = 0, out = 0;
int mutex = 1, empty = MAX, full = 0; // Simulating semaphores

void wait(int *s) {
    while (*s <= 0); // Busy wait if the semaphore is 0
    (*s)--;         // Decrement semaphore
}

void signal(int *s) {
    (*s)++;         // Increment semaphore
}

void producer() {
    int item;
    wait(&empty);    // Wait if the buffer is full
    wait(&mutex);    // Enter critical section (mutex)

    item = rand() % 100; // Produce a random item
    buffer[in] = item;   // Put item in the buffer
    printf("Producer produces item: %d\n", item);

    in = (in + 1) % MAX; // Move to next position in the buffer

    signal(&mutex);    // Exit critical section
    signal(&full);     // Increment full semaphore (item added to buffer)
}

void consumer() {
    int item;
    wait(&full);     // Wait if the buffer is empty
    wait(&mutex);    // Enter critical section (mutex)

    item = buffer[out]; // Get item from the buffer
    printf("Consumer consumes item: %d\n", item);

    out = (out + 1) % MAX; // Move to next position in the buffer

    signal(&mutex);    // Exit critical section
    signal(&empty);    // Increment empty semaphore (item consumed)
}
```

```c
int main() {
    int choice;

    while(1) {
        printf("\nPress 1 for producer\nPress 2 for consumer\nPress 3 for exit\nEnter your choice: ");
        scanf("%d", &choice);

        if (choice == 1) {
            producer();
        } else if (choice == 2) {
            consumer();
        } else if (choice == 3) {
            break;
        } else {
            printf("Invalid choice. Please enter 1, 2, or 3.\n");
            continue;
        }

        // Prompt for next choice after producing or consuming
        printf("Enter your choice: ");
    }

    return 0;
}
```

OUTPUT :