**LAB-5**

**Producer-Consumer problem**

1. Write a C program to simulate producer-consumer problem using semaphores.

#include <stdio.h>

#include <stdlib.h>

int mutex = 1, full = 0, empty = 3, x = 0;

void producer();

void consumer();

int wait(int);

int signal(int);

int main() {

int n;

printf("\n1. Producer\n2. Consumer\n3. Exit");

while (1) {

printf("\nEnter your choice: ");

scanf("%d", &n);

switch (n) {

case 1:

if ((mutex == 1) && (empty != 0)) {

producer();

} else {

printf("Buffer is full!!");

}

break;

case 2:

if ((mutex == 1) && (full != 0)) {

consumer();

} else {

printf("Buffer is empty!!");

}

break;

case 3:

exit(0);

break;

default:

printf("Invalid choice! Please enter 1, 2, or 3.");

break;

}

}

return 0;

}

int wait(int s) {

return --s;

}

int signal(int s) {

return ++s;

}

void producer() {

mutex = wait(mutex);

full = signal(full);

empty = wait(empty);

x++;

printf("\nProducer produces the item %d", x);

mutex = signal(mutex);

}

void consumer() {

mutex = wait(mutex);

full = wait(full);

empty = signal(empty);

printf("\nConsumer consumes item %d", x);

x--;

mutex = signal(mutex);

}

OUTPUT:

