

Test - 2

Q 1 Define IC , N , M , and P_2 as Semaphores
Where $N=10$, $M=1$ and $P_2=0$, $IC=0$

<u>P_1</u>	<u>P_2</u>	<u>consumer</u>
wait (N)	wait (P_2)	wait (IC).
wait (M)	wait (M).	wait (M).
< Produce Item >	< complete Prod >	< consume >
Signal (M).	Signal (M)	Signal (M)
Signal P_2	Signal (IC)	Signal (N).

- * If complete Synchronization is not achieved you would have lost 50% Marks
- * Some of you have written code where P_1 can not produce next item until P_2 has completed production. In this case, you would have lost 3 Marks.
- * If some of you have initialized semaphore variables to -ve value, you would have lost complete Marks.
- * You can only perform wait & signal operation on semaphore variables. You can not compare or decrement or increment semaphore variables. In such a case, you would have lost complete marks.

Q2

Semaphore

 $P=2$, $A=0$, $R=0$, $m=1$ Shared Variable ~~count~~ $CT=0$

<u>P</u>	<u>A</u>	<u>R</u>
$\text{Wait}(P)$ $\text{wait}(M)$ $\langle \quad \rangle$ $\text{Signal}(M)$ $\text{Signal}(A)$	$\text{Wait}(A)$ $\text{Wait}(A)$ $\text{wait}(M)$ $\langle \quad \rangle$ $\text{Signal}(R)$ $\text{Signal}(R)$ $\text{Signal}(M)$	$\text{Wait}(R)$ $\text{Wait}(M)$ $\langle \quad \rangle$ $CT = CT + 1;$ If $(CT = 2)$ then $\{ \text{Signal}(P);$ $\text{Signal}(P);$ $CT = 0$ } else $\text{Signal}(M)$

Solution using only Semaphores.

$P=2$	$m=2$, $A=0$	$R=0$
<u>P</u>	<u>A</u>	<u>R</u>
$\text{Wait}(P)$ $\text{Wait}(M)$ $\text{Wait}(M)$ $\langle \quad \rangle$ $\text{Signal}(M)$ $\text{Signal}(M)$ $\text{Signal}(A)$	$\text{Wait}(A)$ $\text{Wait}(A)$ $\text{Wait}(M)$ $\text{Wait}(M)$ $\langle \quad \rangle$ $\text{Signal}(R)$ $\text{Signal}(R)$	$\text{Wait}(R)$ $\langle \quad \rangle$ $\text{Signal}(P)$ $\text{Signal}(M)$

In this solution if 1st Process P you write

 $\text{Wait}(M)$
 $\text{Wait}(M)$
 $\text{Wait}(P)$
 then the

 solution is wrong (find why?).
 please also check the comments written in Q1