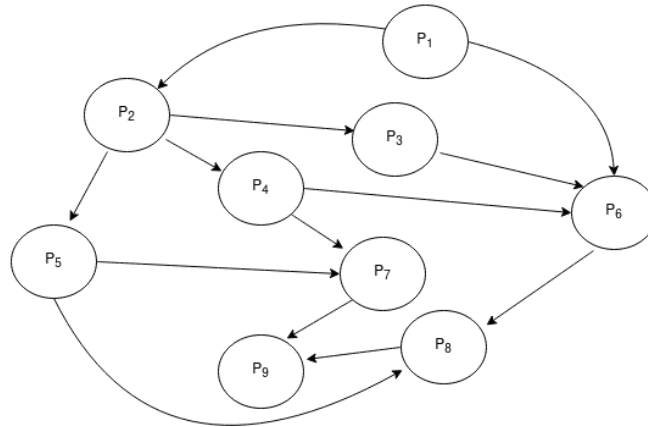


1.

a)

1a Precedence Graph



b) This system is non-determinate

2.

5 semaphores = x_1, x_2, x_3, x_4, x_5

BEGIN SEMAPHORE $x_1, x_2, x_3, x_4, x_5, x_6, x_7$

$x_1 = 1, x_2 = 1, x_3 = 0, x_4 = 0, x_5 = 0, x_6 = 0, x_7 = 0$

PARBEGIN

$P(x_1) P1 \quad (x_3) V(x_5)$

$P(x_2) P2 \quad (x_4)$

$P(x_3) P3 \quad (x_6)$

$P(x_4) P(x_6) P4 \quad (x_7)$

$P(x_5) P(x_7) P5$

PAREND

END

$P(x_1) : \text{UP}$

$(x_3) : \text{DOWN}$

$P(1) : \text{success}$

$P(0) : \text{failure}$