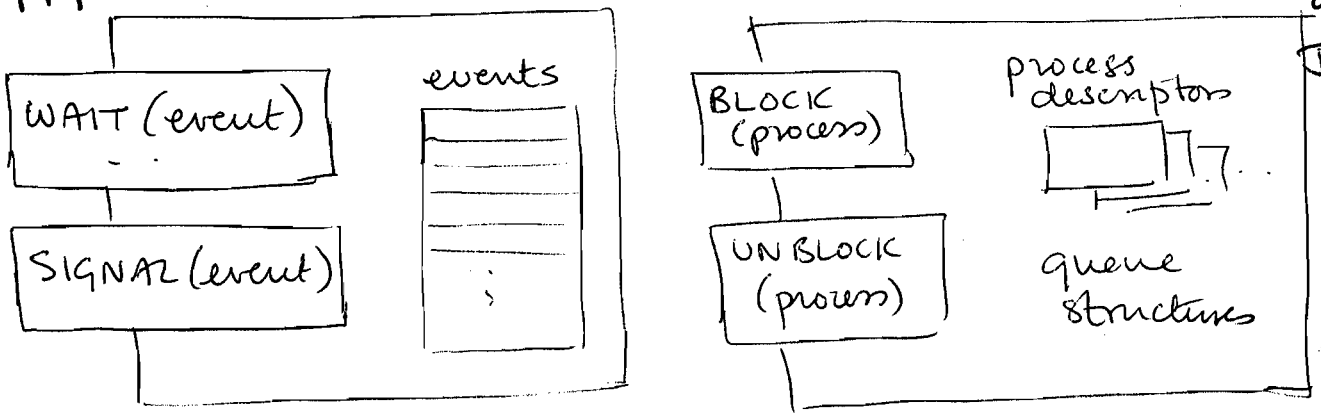
1999 Operating System Foundations Solution · Paper 10 q8 JMB



a) event data — signalled/not signalled (wake-up-waiting)
which process(es) are waiting for it

process data — descriptors: state - register values blocked/runnable time quantum/left
PC - start address exception address
space for links to form run queues.

6 queue structures — chained lists of descriptors of runnable processes.

b) WAIT (event) — if not occurred - add note process to event queue & call BLOCK (process).

BLOCK (process) — change state & reschedule.

SIGNAL (event) — free waiting process or indicate wake-up waiting

4 call UNBLOCK (process)

UNBLOCK (process) — change state & add to appropriate run queue.

5 c) WAIT & SIGNAL concurrent - race condition - deadlock
WAIT/WAIT & SIGNAL/SIGNAL - corrupt data structures - (explain)

2 d) forbid or raise interrupt level (at start of during) operation to make them atomic

3 e) use a semaphore or boolean per event or monitor lock/module spin on lock (can't block trying to block).

(20) (marks may be redistributed with detail)