Questions

Q7-1 You are designing an embedded system using an Intel 486 as a host. Does it make sense to add an accelerator to implement the function z = ax + by + c? Explain.

Q7-2 You are designing an embedded system using an Intel 486 with no floating-point support as host. Does it make sense to add an accelerator to implement the floating-point function $s = A\sin(2\pi f + \phi)$? Explain.

Q7-3 You are designing an embedded system using an Intel Pentium III as host. Does it make sense to add an accelerator to implement the floating-point function $s = A\sin(2\pi f + \phi)$? Explain.

Q7-4 You are designing an accelerated system that performs the following function as its main task:

```
for (i = 0; i < M; i++)
    for (j = 0; j < N; j++)
        f[i][j] = (pix[i][j - 1] + pix[i - 1][j] + pix[i][j] + pix[i + 1][j] +
        pix[i][j + 1])/(5*MAXVAL);
```

Assume that the accelerator has the entire pix and f arrays in its internal memory during the entire computation—pix is read into the accelerator before the operations begin and f is written out after all computations have been completed.

a. Show a system schedule for the host, accelerator, and bus assuming that the accelerator is inactive during all data transfers. (All data are sent to the accelerator before it starts and data are read from the accelerator after the computations are finished.)

b. Show a system schedule for the host, accelerator, and bus assuming that the accelerator has enough memory for two pix and f arrays and that the host can transfer data for one set of computations while another set is being performed.

Q7-5 Find the longest path through the graph below, using the computation times on the nodes and the communication times on the edges.