**ASSIGNMENT 4**

Q1. Two independent Instruction streams A and B are given as below. Assume that the system has one Floating point ALU and three Integer ALUs. Using Simultaneous Multithreading show how the instructions are scheduled to these resources.

Instruction Stream B

add a,b,n

fmul d,b,n

mul g,h,a

add f,d,g

fadd h,a,g

add m,g,f

Instruction Stream A

add a,b,c

add d,b,c

add f,a,d

mul g,d,h

fmul k,g,f

add m,g,k

Q2. Write a program in MPI which implements the functionality of MPI\_Reduce using point to point communication routines.

Q3.

1. Using n tasks (where n<=N), write a PVM program to find

1! + (1+2) + 3! + (1+2+3+4) + ………..+ either N! or (1+2+…..+N) depending upon N is odd or even.

b) How the message passing in PVM is different from MPI?

Q4. With the help of a block diagram show how the

1. 2D Grid of 1D Block
2. 2D Grid of 2D Block

can be represented in CUDA by mentioning blockId and threadId. How will you calculate the threadId of each thread?