

Parallel Computing
Minor-I

Max. Marks: 20

Date: September 16th, 2014
Duration 60 min.

Note: 1. Attempt all questions.
2. Draw neat diagrams, if needed.

- Q.1 If 90% of a program's execution time occurs inside a loop that can be executed in parallel, what is the maximum speedup we should expect from a parallel version of a program that is executed on 16 CPU's? Compare it to the degree to which a program can be sped up due to parallelization using *Gustafson-Barsis' law*. [4]
- Q.2 Prove that in the Pyramid Network total no. of processors of size k^2 are $(4/3)k^2 - (1/3)$. [4]
- Q.3 Propose an efficient parallel algorithm for merging two sorted lists. Calculate parallel time and processor's complexities. [4]
- Q.4 What do you understand by the concept of reducing the number of processors in the PRAM computations? Explain with an example. [4]
- Q.5 Devise a parallel algorithm for finding $n!$ (factorial of 'n') using doubling technique. What is the parallel time and processors' complexity? [4]

-----Best of Luck-----