# GANPAT UNIVERSITY
## B.Tech. SEM. VII COMPUTER ENGINEERING /INFORMATION TECHNOLOGY
## REGULAR EXAMINATION NOV/DEC - 2011
### CE/IT-704: Parallel Processing & Architecture

Max Time: 3 Hours]                                                    [Total Marks: 70

Instructions:     1. Write all program in C.
                  2. Assume necessary data.

## SECTION-I

**Que.1 (a)** Consider seven integer arrays A, B, C, D, E, F & X. Let their size be 200. Write a program to achieve following. [5]

$$X[0] = A[0] + B[0] + C[0] + D[0] + E[0] + F[0]$$
$$X[1] = A[1] + B[1] + C[1] + D[1] + E[1] + F[1]$$
$$\vdots$$
$$X[199] = A[199] + B[199] + C[199] + D[199] + E[199] + F[199]$$

Use four processes. Use expression splitting with single barrier technique.

**(b)** Write a parallel program to find histogram of an array having 500 sizes by using any method, use total 8 processes. [5]

**(c)** Write limitations of loop splitting. [2]

### OR

**Que.1 (a)** Write a parallel program to find factorial of a given number using self scheduling, use total 2 processes. [5]

**(b)** Write a parallel program to find maximum from an array having 700 sizes by using efficient loop splitting, use total 3 processes.(Find final maximum before process_join() and print after process_join()) [5]

**(c)** Why barrier is used in a parallel program? [2]

**Que.2 (a)** Write a parallel program which adds odd & even index elements in a given array having 500 sizes by using any method. Use total 2 processes. [5]

**(b)** Write a program to multiply matrix into vector multiplication. Size of matrix is 10*10 and array is 10. Use variation on Loop splitting, use total 16 processes. [6]

### OR

**Que.2 (a)** Write a program to multiply matrix into vector multiplication by using variation on self scheduling. Size of matrix is 10*10 and array is 10, use total 16 processes. [5]

**(b)** Consider X as an integer array of size 201. Write a program which will do the following, [6]

$$X[0] = X[1]$$
$$X[1] = X[2]$$
$$\vdots$$
$$X[199] = X[200]$$

Use block scheduling and 4 processes.

**Que.3 (a)** Write user define function for the following [12]

i. process_fork()   ii. process_join()   iii. sharei()   iv. Init_lock()   v. spin_lock()

vi. spin_unlock()   vii. init_barrier()   viii. barrier().

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## SECTION-II

**Que.4** **(a)** Explain data parallelism and derive the formula for speedup and efficiency due to parallel processor. **[8]**

**(b)** List out disadvantages of temporal parallelism. **[4]**

**OR**

**Que.4** **(a)** List out various interesting features of parallel computers and explain it. **[4]**

**(b)** Compare data & temporal in detail. **[8]**

**Que.5** **(a)** An examination paper has 16 questions and total number of answer books is 2000. Each question takes 6 minutes to correct. If 4 teachers are employed for correction in pipeline mode. Then calculate the speedup and efficiency. If 8 teachers are employed instead of 4, calculate the speedup and efficiency. Repeat with 32 teachers and 4 pipelines. **[7]**

**(b)** Draw different three instruction format of SMAC2P. **[4]**

**OR**

**Que.5** **(a)** Explain Fetch and decode Instruction steps of instruction execution with block diagram. **[6]**

**(b)** In pipeline the maximum ideal speedup is 10. The percentage of unconditional branch in typical programs is 5% and that of conditional branch is 20%. But only 60% of conditional branch are taken in the programs. Find Speedup with branches and % loss of speedup due to branches. **[5]**

**Que.6** **(a)** Write the field of branch prediction buffer memory. **[2]**

**(b)** Explain random access machine (RAM) model in detail. **[4]**

**(c)** Explain the Interconnection network in detail **[6]**

**END OF PAPER**